

COMPUTER WORLD

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Conversion Problems Listed

Problems connected with converting Cobl programs to PL/I, as listed in Appendix A of the current IBM manual.

1. Use of DEPENDING ON with an OCCURS clause.
2. Differences in resulting precision of arithmetic operations.
3. No Report Writer in PL/I due to core requirements.
4. No channel overflow tests under PL/I.
5. No equivalent of the REEL or UNIT in the CLOSE statement.
6. Certain required manual changes to records defined in working storage.
7. PL/I limitation of external names to seven characters.
8. Relation tests involving group items may produce erroneous results in PL/I.
9. Due to undefinable results, a MOVE for self-defining structures cannot be converted.
10. EXAMINE and TRANSFORM are not fully handled.
11. Output formats for DISPLAY clauses may be different in PL/I.
12. When CORRESPONDING option is used with ADD and SUBTRACT, the ROUNDED option cannot be implemented.
13. RERUN option cannot be used because PL/I has no checkpoint.
14. There are no PL/I equivalents for TRACK AREA and FILE LIMIT.
15. The external linkage conventions are different for PL/I.
16. It is not permitted to call an I/O sort file with SORTIN.
17. Use of the character 0 (zero) in picture clauses will be rejected by a B, because no equivalent exists in PL/I.

Computer Captured

College Reviews Site Plan

WALTHAM, Mass. — Brandeis University officials are reevaluating their chosen site for their new computer in light of the recent take-over of the computer and communications center by black militant students.

Referring to the Brandeis IBM 1130 as their "\$200,000 lever," the students at one time threatened to "burn the building down" in their bargaining to make more black professors and other related concessions.

Lester G. Loomis, Brandeis vice president for financial affairs, had toured the computer and communications center the day before the student take-over looking for an area to locate an IBM 360/20 now on order.

"We were planning to locate both the academic and financial computers in one center, but now it may be better not to have the new computer on campus," Loomis said.

"The possible damage a student could do to disks or tapes would be incalculable, and I'm thankful that this happened now instead of after July when we are scheduled to start using the 360."

Loomis said that the possibility of "take-overs and the destruction of records had been a food for thought."

...des now is using a com-

mination of tabulating equipment and hand posting for billing, accounts receivable, budgeting, report cards, and other regular and financial functions. The payroll, however, is run on a computer at a nearby bank.

The IBM 1130 is used for class assignments, student research projects, and as a terminal to a CDC 6600 located in New York City. Pending regaining use of the computer, university officials suspended class assignments and research projects, and planned to fly work for the CDC 6600 to New York.

On the Inside

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Text and Analysis Of DFFBAG-IBM Suit

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IBM Plans to Release Cobo-PL/I Converter

Special to Computerworld
NEW YORK — Cobo to PL/I conversion appears to be a near-reality for OS/360 users — at least according to an IBM document dated Dec. 16, 1968, which was received by several people recently.

The people who received the document then received a follow-up letter apologizing for

the "inconvenience it may have caused" and requesting its return in a postage-paid enclosed envelope.

The document (C33-2001), a preliminary letter release from IBM's French division, was in the form of a standard IBM System Reference Library publication in undated form. The document contained a

statement-by-statement analysis of the conversion of Cobl programs to PL/I.

It contained programming tips to assist in conversion, a detailed analysis of the problems involved, and express instructions concerning steps for the automatic and manual conversion of programs.

Conversion Restrictions

Several conversion restrictions were noted, as distinct from implementation restrictions, and listed [See box].

Three Languages Involved

After Computerworld questioned IBM, it turned out that this was one of three such language conversion programs. The other two are for Fortran IV and Algol to PL/I. The other conversion programs are available immediately. The Cobl program will be made available May 15.

It appears that a general error occurred when a "functionary" in the Poughkeepsie office of IBM attached the wrong mailing list to the job sign for circulation, according to an IBM spokesman. The confusion was compounded by the attachment of another wrong mailing list to the retraction letter, he said. This resulted in the letter going to people who had not received the manual.

AT&T to Release Details Of New Tariff Revisions

WASHINGTON, D.C. — The American Telephone & Telegraph Co. will announce by Jan. 24 details of the specific tariff revisions which it is prepared to make, according to Bernard Strassburg, chief of the Federal Communications Commission's Common Carrier Bureau.

Strassburg made the statement in a letter to about 30 interested parties who already have asked the FCC to request, suspend, or investigate the new "foreign attachments" and interconnection tariffs which went into effect Jan. 1. The letter invited the various parties to submit recommendations by Feb. 24 to be considered at an informal conference on telephone tariffs.

Strassburg noted that many of the recommendations already had been submitted, but he said that many had been in general terms not suitable for "meaningful consideration at a technical conference." He requested that recommendations be discussed at the conference be tailored and include tariff references.

The commission ordered the conference Dec. 24, when it adopted an order allowing the revised "foreign attachment" and interconnection tariffs to go into effect. The tariffs were filed by AT&T following the commission's June decision that the existing "foreign attachment" tariffs were unlawful.

Software Patent Defended

WASHINGTON, D.C. — The case of the Patent and Trademark Office continued here last week with the Association of Independent Software Companies opposing the patent commissioner's request for a rehearing.

In its "friend of the court" brief, the association followed the literary style set by the Patent Office's petition which brought in everything from the *Federalist Papers* to George Orwell's *1984* and which contended that patents for computer programs could lead to thought control.

Employer's New Clothes

In its objection, the association said that the Patent Office had been fooled like the emperor in Grimm's fairy tale, *The Emperor's New Clothes*, and that it now stood exposed as the creator of a legal fiction. It went on to claim that the petition for rehearing employed scare tactics and set out to create an atmosphere of fear and apprehension.

In the more legal parts of the

brief, the association contends that the Patent Office never had raised the issue of mental process to bar hardware embodiments of software, although

hardware and software are equivalent, and the question of which form is to be used in a particular case is simply a matter of practical considerations.

IBM Does Turnabout, Reinstates Reductions in Maintenance Prices

WHITE PLAINS, N.Y. — IBM will reduce maintenance charges on many second-generation pieces of equipment starting Feb. 1.

No increased maintenance charges have been announced to go along with the decrease, as was the case last November. At that time increases of up to 20%, mostly on third generation equipment, were simultaneously announced, and then both increases and decreases were withdrawn as a result of protests from leasing companies.

The new announcement is mainly a reinstatement of the original reductions, which were said to have been determined by a unit-by-unit examination of actual field maintenance costs.

Maintenance in Limelight

The maintenance area has figured prominently in the recent law suits against IBM by Control Data and Data Processing Financial & General. In general both companies have claimed that IBM's policy has been to effectively prevent competition in maintenance from becoming economically practical.

'Starter' System Announced For Small, First-Time Users

BRIDGEPORT, Conn.—A "starter" system for small companies ready to acquire their first computer has been announced by General Electric.

The new GE-105, the latest member of the GE-100 line, comes in 4K and 8K models and leases for \$1250 and up per month.

System software will include an assembly programming system, an extended report program generator called Logel, and utility programs such as List, Summarize, Reproduce, and Gapunch.

Applications packages available will include Simtab for running tab jobs, a 4K payroll program, Procon-115 for production con-

trol, and Critical Path Method (CPM).

The computer has a 7.5 micro-second memory cycle. The normal configuration for the Model A is 4K or 8K storage, a 350-card-per-minute reader, a 250-line-per-minute printer, and a 60

to 200-card-per-minute punch. The normal configuration for the Model B is 8K storage, a 300-line-per-minute printer, and a 300-card-per-minute reader/punch.

Delivery will be six months from order, GE said.

Computer Traces Baggage

NEW YORK—The next time an airline lets one of your suitcases go astray, a computer may help you find it.

Thirty-one airlines have set up a computerized system for tracing baggage missing for 72 hours or more, according to the Air Transport Association.

Under the Airlines Computer Tracing System (Act), each airline prepares a daily list of bags on hand for which it can't find owners and of missing bags. The lists go to the Eastern Air Lines computer center in Charlotte, N.C., where a Univac 494 compares the lost and found lists.



Sun Watcher

This computer-directed radio telescope at the Air Force Cambridge Research Laboratory, Waltham, Mass., is being used to predict solar radiations that might be harmful to space travelers. Unlike previous automatic tracking systems, which had to be programmed in advance, the IBM 1800 computer can zero the telescope in on budding solar flares within minutes.

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Newest Edition

Computerworld publisher Patrick McGovern and his wife recently brought out a new edition—Elizabeth S. McGovern.

The birth Jan. 6 of the 6 lb., 8 oz. baby increased the size of the McGovern household to four. The McGovern's other child is a boy, Patrick J. McGovern III, 4.

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AF to Standardize Documentation

HANSCOM FIELD, Mass. — The Air Force, possibly the largest user of computers, is taking a look at its various methods of computer program documentation to see what can be done about standardization to reduce costs and save time.

The Systems Command's Electronic Systems Division here is seeking a contractor to make a 12-month study that will lead to a "general standard for computer program documentation."

At present, the Air Force uses many different documentation standards independently developed by various Air Force organizations.

The use of more than one standard causes many problems in the development and use of computer programs.

When Air Force computer personnel are transferred to different commands, retraining is often necessary because of the different methods of documentation.

A large part of the software used by the Air Force has been developed by contractors and documented according to standards of the procuring organization. These standards may differ from those of the using organization.

General Standard

The object of this effort is to develop an approach leading to a general standard.

The contractor selected to perform the study will be furnished all applicable Air Force and selected non-Air Force documents

on computer program documentation for analysis. The contractor will develop a detailed outline that gives the structure of the "general standard." This approach will be distributed among the organizations of the Air Force, and after approval, the

process of implementation would begin, ending with the "general standard."

The study is expected to be completed in the spring of 1970. Contract monitor for the Electronic Systems Division is Lt. John P. McLean.

Eckert to Receive National Medal

WASHINGTON, D.C. — Computer pioneer John P. Eckert will be one of this year's recipients of the National Medal of Science, President Johnson has announced.

Eckert, vice president of Univac, will be cited "for pioneering and continuing contributions in creating, developing, and improving the high-speed electronic digital computer."

The medal is the government's highest award for distinguished achievement in science, mathematics, and engineering.

Meanwhile, in England, Dr. Jack Howlett, director of the Atlas Computing Laboratory, has been awarded the CBE (Commander of the British Empire) for his work with computers.

Computers Seen Saving Congress \$5 Billion/Year

WASHINGTON, D.C. — "Use of computers in the legislative process of Congress could save billions annually," Rep. Jack Brooks, D-Texas, said as he introduced legislation this month to set up effective use of computers by the House and Senate. Under the Brooks legislation, the comptroller general would be authorized to acquire the computer capacity necessary to provide data needed by Congress.

"Data processing," Brooks said, "has reached the point of development where it can be of material assistance to Congress in coping with the constantly increasing complexity and volume of data inherent in the legislative process. The time has come for Congress to make full use of these new capabilities."

"With a flow of more accurate, up-to-date information on government operations, better decisions could be made throughout the budget and appropriations cycle, deficiencies in government operations more easily corrected, and wastes and duplications more easily recognized."

"Computers," he said, "could also be used to perform a number of other informational purposes in the legislative process. These include: maintaining the status of bills and resolutions that have been introduced, as well as the index of the Congressional Record. Prompt and effective data of this type would be of material assistance to individual congressmen in evaluating the many complex proposals that are introduced in the House and Senate each year."

Under the Brooks proposal, responsibility for establishing and maintaining a congressional computer system would be delegated to the General Accounting Office. According to Brooks, the overall responsibilities of the GAO, "congressional watchdog" agency, closely coincide with the operations to be established.

The Brooks proposal also provides for the development of a staff of specialized cost analysis experts in the General Accounting Office to assist Congress in the analysis of legislation and appropriation requests.

Brooks urged prompt action on this measure, declaring, "Based upon sound experience in business, industry, and government, a significant increase in operational efficiency can be expected incident to the efficient and effective introduction and use of data processing. If data processing were to provide us with only a 5% increase in efficiency in handling budget and appropriation matters, the annual saving under present budgetary

outlays would exceed \$5 billion annually."



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TALLY

Editorials

The Job of Pioneers

"When law professors become as knowledgeable about computers as their students are, then we expect to discontinue this course."

This was the way that Roy Freed announced the new "Computers and Law" course at Boston University. His comment was very interesting because we are finding our pages filled with legal case after legal case. Almost every week during the past three months there have been announcements and releases on the legal front. As a result, *Computerworld* has been looking more like an update of law reports. This was never our intention. Yet, we make no apologies. In fact, the current state of legal activity is a natural consequence of the newness of our industry.

We have proceeded for some years now with a minimum of legal definitions of our rights and duties, of their meanings and implications, and of the mutual understanding between buyer and seller. Yet our buying and selling represents an increasing and significant part of the gross national product.

We are not trained as attorneys, but until attorneys themselves are trained, we have a duty to help. As soon as the attorneys are trained, very little of our time will need to be given to the legal area, and we shall be, as part of our pioneering, to move on to other tasks.

In short, establishing the legal principles for our day-to-day activities is just one of the phases of the development of our industry. This is one which has been neglected to date and one which probably will take us a few years to develop. It is one which, after a few years, we hopefully shall be able to refer to a trained legal profession.

It is one of the jobs of a pioneer.

Maintenance Prices

IBM's reinstatement of maintenance price reductions on more than 200 pieces of equipment is welcome. It will be recalled that these reductions originally were part of an over-all series of changes—both increases and decreases—which were withdrawn a few days after announcement, apparently because of pressure from leasing companies.

Computerworld commented at the time that the withdrawal of the price increases naturally was welcomed by the user, no matter why they were withdrawn. On the other hand, the simultaneous withdrawal of the price decreases, which apparently had been earned, was disappointing.

We are glad IBM has reconfirmed its original decision to offer the decreases.

Viewpoint

ACM Reform Is Viewed as the Real 'Question of Importance' to Members

By Carol Simpson

In the mail with Christmas cards, department store catalogs, and bills, member of the Association for Computing Machinery received a small envelope containing what may turn out to be a present—the chance to vote directly on a substantive ACM issue.

This is believed to be the first time in recent ACM history that a "question of importance" has been submitted to the membership. Although the question was limited to the publication of an ACM news periodical, the ballot reflected a question of more serious importance—the growing dissatisfaction of an element of the membership with overall ACM goals and related management policies.

The envelope received by ACM members contained a cover letter explaining the purpose of the ballot by Bernard Galler, president of the association, the ballot itself, containing the question, "Should ACM publish a news publication?", and four attachments to assist members in their consideration of the issue. This supporting material consists of a history of the ACM news publication proposal, a fact sheet for the proposed ACM news publication, a pro statement, and a con statement.

Problems Revealed

Although this material directly addressed the issue of the news publication, it inadvertently uncovered some of the more deep-rooted problems underlying

membership dissatisfaction. In particular, the material reflected the considerable degree of confusion that appear to exist in the ACM Council concerning how it should go about gathering information and making business-like decisions, especially in the area of publications.

While the historical material reports repeated debates in at least three council meetings with near unanimity reported each time, the "informal" council vote reported in the cover letter that unanimity dissolved to a slight margin: 12 in favor and 10 against. The historical material implies that a sufficient financial analysis of the news publication was available to the council in November 1967. Yet the fact sheet and "pro" statement included only the most rudimentary and unsupported financial information.

In spite of the year of analysis and study devoted to the issue, the president's cover letter states only that "...if favorable action is obtained from this ballot, the ACM Council will take the appropriate and necessary steps to adjust the budget for the activities and services in order to provide funding for the news publication." It does not give the membership a clue as to how its activities and services will be cut.

Growing Dissatisfaction

Although the news publication itself is important for the immediate future of the association, the underlying issue of growing

membership dissatisfaction is much more crucial to its long term vitality. This dissatisfaction centers around the programs and goals of the association and how they are being carried out today.

The general purposes established for the association 20 years ago are general and broad enough to be valid today. However, the programs and goals which were started 20 years ago were not intended to be, and are not, flexible enough for today's needs. In particular the methods, procedures, and policies used 20 years ago to attain these goals are no longer applicable.

The main contentions underlying the ACM membership dissatisfaction group into three categories:

First, the ACM structure and goals have remained essentially unchanged over a 20-year period in an environment that has been revolutionized several times over.

Second, the management practices and procedures used by the ACM leadership are amateurish and designed for a small club and are not suited to making rapid, professional, business-like decisions for an organization of 25,000 members with a \$2-million annual budget.

"Closed-Club" Atmosphere

Third, there is self-perpetuating "closed-club" atmosphere which is resulting in an increasing natural resistance to basic change as is indicated by the association's inability to attract members from the newer, (Continued on Page 5)

Letters to the Editor

Fighting City Hall

To the Editor:

It was with great interest that I noted the "Viewpoint" article of Dec. 11 by George Simon. In this article he asks the readers to act "professional" and to ask for, rather than accept (information) from the manufacturer. A joint committee representing the National Society of Control & Financial Officers of Savings Institutions, an affiliate of the United States Savings and Loan League, and the National Association of Mutual Savings Banks, has done exactly this.

The committee researched and met with the various manufacturers of savings institutions on-line terminals and finally developed a set of specifications to guide the manufacturers in their development of a new generation of on-line terminals. Through the use of trade magazines and other publications we have urged all mutual savings banks and savings and loan associations to delay equipment purchases until new terminals are available.

We cannot totally assess our effectiveness but we do know that we have gotten the ears of the manufacturers and feel that we have substantially advanced their plans for making

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available these new terminals.

Theodore R. Halusa

Secretary
On-Line Equipment & Communications Specifications Committee, NSC
Chicago

Successful Candidate

To the Editor:

Your article Nov. 20 (Brooks, Gallagher Returned to Congress) listed several EPD persons who ran for elective office in November.

I should like to report that I was elected representative for the 31st District to the 125th Delaware General Assembly. The term is for two years. My district includes the towns of Dover, which is the state capital, and Wyoming. I am a Republican and have been working actively in politics for ten years.

My responsibility at Speakman is to manage the data processing department which operates a four tape Honeywell 120 System.

Neal Moerschel
Manager EPD


Speakman Co.
Wilmington, Del.

Conference Comment

To the Editor:

My congratulations to the exhibitors at the Fall Joint Computer Conference who responded so well to the needs of the out-of-town computer professional. The show was excellent. I frankly don't recall a great deal about the hardware, but the software was outstanding. Miss Century 100, for example, had many excellent features, particularly in the area of the main frame. After a preliminary scan, I attempted a dis-upt operation, only to find out upon inspection that the week's processing full. Since time sharing was definitely out, I decided to retire to the hotel cocktail lounge and contemplate next year's conference and Miss Century 200.

William R. Englander
Mill Valley
Calif.



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THE NEWSLETTER FOR THE COMPUTER COMMUNITY

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ACM Reform Called Overdue

(continued from Page 4)
more vital areas of data processing. Also, while the membership can express opinions within the long-established framework of the organizational programs and procedures, there is no effective mechanism to allow basic principles to be challenged and modified in response to changing requirements.

There would appear to be some truth to these allegations. The organizational working structure of the ACM appears to be essentially the same as it was 20 years ago. Growth appears to have occurred in a haphazard manner. Standing committees, ad hoc committees, special interest groups, and publications have been created when some need, real or imaginary, was felt.

The present committee structure is almost unrepresentative. Some ad hoc committees are apparently more nearly permanent and certainly more important than some standing committees. The distinctions in responsibility between special interest committees, ad hoc committees, and standing committees are obscure.

Council Problems

Both executive and legislative responsibilities reside with the council. It meets too seldom (three times a year) to permit it to manage well, even under the best of circumstances, and it is too far removed from individual members to permit it to represent them effectively.

The relationships among the council, the multitude of committees, and the national office have evolved in an informal manner making it virtually impossible for the uninitiated to accomplish anything and for the initiated to respond quickly.

Thus the association is put in a position of reacting on a case-by-case basis to crises rather than broadly reformulating its overall programs and policies.

Although ACM has grown to an organization of 25,000 members with an annual budget of approximately \$2 million, the methods and procedures used to manage the organization appear to have undergone little change in basic structure from the time of its inception as a small club. Even the creation of a national office appears to have had little effect on the management policies and procedures.

Financial records appear to be kept in a summary form only, ignoring the rudimentary techniques of cost control accounting. Thus the council and other members are unable to obtain the type of financial information needed to make sound financial decisions.

Furthermore, the record keeping methods employed by the association are also relics of the "old days." Although council meetings are conducted in an extremely formal manner, the minutes that are kept are frequently unable to resolve such

basic questions as what was this motion voted upon.

Changed Environment

Twenty years ago when the ACM was formed most of the computers were used for scientific work in research environments. Today the majority of computers are used by non-scientific oriented people in a far broader range of applications. Yet ACM has not been able to attract many members from these newer and less scientifically oriented areas of data processing.

In spite of expressed intentions, ACM is not the organization for the professional scientist. It remains the organization for the computer scientist. This results in a vicious circle of closed membership in which the majority of the ACM leadership remains associated with scientifically oriented computer research and the services and publications are designed for the needs of this specialized segment of the industry. Thus, although ACM has grown substantially, the ratio of ACM members to its potential membership appears to have substantially decreased.

In the context of the future of ACM, the vote on the new publication takes on added importance. The "question of importance" was inserted in the ACM Constitution as one of the checks on the leadership of the association when it loses touch with the needs of the membership. The raising of the question at this time has served as a signal to the council that at least part of the membership is not indifferent to the actions of the council.

Undoubtedly the public airing of the debate over the new publications already has begun to have a beneficial effect both on the council and the association. The council has now been made aware that its actions are being followed and that the members are interested in the direction of the association.

I believe that an active membership and a flexible and responsive leadership is required to make the association a well-known and respected professional organization.

The question of an ACM news publication is one of immediate importance to the financial integrity of the association, and I personally believe it should be decided.

A large vote either for or against the publication should serve as a notice to the council that the membership is interested in the management of the association and that membership indifference of apathy cannot be counted on to overlook sloppy management policies and procedures.

The necessary reform of ACM will require a long time and much effort. A vote on the new publication—either for or against—is a necessary first step towards accomplishing this goal.

The author, a member of ACM since 1958 and secretary-treasurer of the Special Interest Group on Programming Languages (Sigplan), was the author of the "con" statement submitted with the "question of importance."

COMPUTER SYSTEMS FOR SALE IBM

IBM 1620 Model 01, 20K, Card Read Punch, Adv. Inst., Auto. Div., OS/4, Ind. Adv., 1622 Model 1, 407 EB Printer, and one 1311 Disc Drive. System is under IBM maintenance contract.

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IBM 1401 Model C3, 4K, Adv. Prog. and HiLoEqual Compare, 1402 Model 1 with Early Card Read, 1403 Model 2. System is under IBM maintenance contract.

Price \$47,000

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Unit Reads Sends Price-Ticket Data

NEW YORK—A system of collecting and transmitting information directly via telephone lines, from Kimball price tickets to a central computer has been announced by Liton Industries Inc.'s Kimball Systems Division. Using the standard Kimball tickets, widely used in retail stores, information can be transmitted directly, without the need for manual intervention or collection. The system can provide retail sales and inventory data on an on-line basis.

The system, called Span, consists of a punched tape reader, a keyboard for entering variable data, a magnetic tape recorder, and an acoustically coupled transmitter located in the store, and a receiver located at the central computer center.

The current system of mailing these tags to the center can be completely replaced by this telephone transmission system, according to the company.

The collection package in the store sells for about \$4000 and leases for \$92.50 per month. The receiving system will sell for about \$30,000 or lease for about \$650 per month, according to a Kimball spokesman. Paper tape receivers will be available for about \$8000 and rent for about \$250 per month.

Data Transcriber

A new data transcriber, MAJ 100, captures an operator's keystrokes and converts them to codes on IBM 7- or 9-track compatible magnetic tape. The unit has automatic cartridge loading for computer compatible tape, and a dual vacuum cassette tape drive. There is no requirement for opening and closing doors or drawers. All displays and indicators are in front of the operator at eye level. Prices start at \$5800 and rentals at \$145 per month. Production deliveries are scheduled to begin in mid 1969. MAJ Equipment Corp., 300 E. 44th St., New York, N.Y.

Analog Computer

A new medium sized analog computer, Comcor 550, is a solid-state 100-volt machine compatible with CDC, IBM, SDS, and Honeywell computers. Analog and digital processing facilities are combined in different areas of one board. Servo set potentiometers or hybrid optical digital attenuators can be utilized. Included are

A new medium sized analog computer, Comcor 550, is a solid-state 100-volt machine compatible with CDC, IBM, SDS, and Honeywell computers. Analog and digital processing facilities are combined in different areas of one board. Servo set potentiometers or hybrid optical digital attenuators can be utilized. Included are

integrated circuit logic and control circuitry, class zero multipliers and resolvers, and a computer system clock. Astrodata Inc., 240 E. Palis Rd., Anaheim, Calif. 92803.

Signal System



A new signal processing system, Compusignal System 3, is a desk size unit with teletypewriter, input sampling, display, output, control, and software included. The unit performs FFTs, Zoom FFTs, auto and cross correlations, convolutions, averaging, histograms, and other standard signal processing routines. Dixon Hall, Inc., 19 Brook Road, Needham Heights, Mass. 02194.

Tape Drives

Three new 60 KC magnetic tape units have been introduced for the PDP-10 line of computers. The units are available at either 7 or 9 track, with full IBM compatibility, and are all controlled by the same control unit. The units are the 7 track TU70 and TU300 units and the 9 track TU30A. They sell for, respectively, \$18,000, \$21,000, and \$22,000. The 9 track unit has a recording density of 800 bpi and the other units offer triple density (200,556,800) recording. Digital Equipment Corp., Maynard, Mass. 01754.

Scoring Computer

A high speed, portable test scoring computer has been designed for use in personnel recruitment and training programs. Called the Datronics 500, the unit scores tests showing a minus sign next to each wrong answer and the total number of correct answers in the margin. The machine has two control switches — On/Off and Program/Score. Answer forms are low cost paper sheets printed on both sides in various sizes and designs. Rochester Datronics, Inc., 1615 N.W. 14th St., Rochester, Minn. 55901.

Test System

A new digital logic module test system, Model 2060A, is a computer controlled automatic system which tests complex logic modules and circuit cards em-

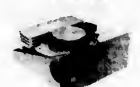
New Products

playing a technique of comparing the production module with a reference module. The system generates high and low logic levels, positive and negative current limits and test tolerances according to test program instructions. It can test logic circuits without hardware changes. A test language, AutoTest, using English test commands; the deci-



mal numbering system; and a conversational mode has been developed for use with the system. Prices begin at \$80,000 including software. Deliveries are scheduled to begin in April. Hewlett-Packard Co., 1501 Page Mill Rd., Palo Alto, Calif. 94304.

Disk Memories



New head per track disk memories interface with all types of commercial digital logic and use a proprietary recording technique to store up to 6.4 million bits on a single disk surface. A complete memory system occupies 8-3/4" of rack space. A separate power supply is available as an option. Data Disc, Inc., 1275 California Ave., Palo Alto, Calif. 94304.

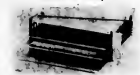
Magnetic Tape Recorder



A new magnetic tape cartridge recorder, the DDR series, is an I/O device for preparation and on-line debugging of new programs, and for permanent program and data storage. Two or more of the recorders interfaced to the computer would enable matching, merging and sort operations to be performed. Individual records can be used and updated directly on the tape without the need of reproducing the entire tape. A tape can be generated off-line on a slow speed device and loaded into the computer at a high transfer rate. A tape can also be generated by the computer at a high data rate

and then moved off-line to the slower device. Redundant tapes may be created and stored separately to assure permanent retention of the information. RWP Corp., 22330 W. Homestead Rd., Cupertino, Calif. 95014.

Core Memory



A new magnetic core memory system, the ECOM-B, consists of a basic 4096 x 18 expandable to 8192 x 18 contained in a 5-1/4" x 19" x 16" module which includes power supply. Word length can be expanded to accommodate 4096 x 36 in a single module with a separate power supply. The system may be purchased in large quantities, less card cage and power supply, for less than \$2400 per unit. This makes the ECOM-B suitable as a subassembly for large volume OEM applications. Standard Memories, Inc., 15130 Ventura Blvd., Sherman Oaks, Calif. 91403.

Data Recorder



A new 7-track, IBM compatible magnetic tape data recorder, the Datacriber, has a 64-character detached keyboard with 16 special keys for control. The unit incorporates a tape transport for automatic tape positioning and recording, verifying and searching, as well as a high speed rewind. Full tape security checks are provided, including longitudinal, lateral and bit-by-bit comparison with memory. Vanguard Data Systems, 3835 Birch St., Newport Beach, Calif. 92660.

Card Reader Terminal



A new card reader terminal has been designed to complement teletype equipment and operates at 10 characters per second. The only moving parts in the unit are the picker knife which takes the punched card from the stack and moves it into position for transfer by the rotor, and the rotary feeder which transfers the card serially from the hopper to the stacker. From hopper to stacker the card is read by photo optics and is transmitted either to the

equipment with which it is interfaced or by telephone line to the time sharing computer. Data Computing, Inc., 412 West Hatcher Rd., Phoenix, Ariz. 85021.



An electronic translator provides for reversal of slope in lens grinding so that a single surface can be concave and convex where desired. Yoked to an SDS 930 computer, the device translates mathematical data into instructions for the lens forming tool. Its output is a 3-track magnetic tape that describes a three dimensional geometry for the automatic tool to follow. Analog Digital Systems, Inc., Palestine, Ill.

Disk Data Input



A data input system, LC 720, utilizing a direct keyboard to magnetic disk storage file consists of standard keyboard input terminals, a central processor which will accept as many as 120 keyboards simultaneously, and an IBM 2311 disk pack drive. Simultaneous entry and verification of data may be done by two different operators. Up to 30 programs may be stored in the system. Logic Corp., 115 E. Euclid Ave., Haddonfield, N.J. 08033.

Tape System



A new magnetic tape system, the Infotec TS-1130, is a flexible I/O device for the IBM 1130 which permits the utilization of file data between the 1130 and the IBM 360 or from other smaller to larger computers. Software support is provided through the 1130 Fortran and the Disk Monitor System, Version 2. The unit is available in 7- and 9-track models and provides medium speed transfer rates for read/write IBM compatible tapes. Tape transport mechanism and all electronics are contained in one compact cabinet. Infotec, Inc., 22 Purchase St., Rye, N.Y. 10580.

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CAI Shown to Aid Language Students

DALLAS — Students who quail at the thought of such perils as German irregular verbs have a friend in the computer, according to a report presented at a meeting of the American Association for the Advancement of Science.

The report, by Dr. E.N. Adams of IBM, is based on the results of a large-scale experiment in computer-assisted instruction (CAI) at the Stony Brook campus of the State University of New York. In the experiment, a group of first-year German students supplemented their regular classroom instruction with "conversations" with a computer. Test scores indicate that these students performed far better in reading and writing German than a control group of students taught by conventional methods, the report said. Moreover, the improvement was greatest among students in the bottom half of the class.

Involved in the experiment were all 250 students who registered for first-year German in the 1967-68 academic year. Of the total, 141 students were assigned to the regular college course. This consisted of three hours a week of reading-writing and audio-lingual instruction by a teacher, and three 25-minute periods of oral drill in a language lab. The other 109 students took the three hours of regular class instruction but had up to 2 1/2 hours per week of practice in German on the CAI system.

Performances Compared

After two full semesters ending June 1968, the performances of the two groups were compared by their scores on a standard

achievement test. The Modern Language Association Cooperative Foreign Language Tests. The tests showed that the two groups were similar in speaking and understanding spoken German. However, the CAI students were markedly superior in reading and writing the language, with 85 percent of the CAI students scoring as high or higher than the average student in the regular class. Furthermore the weaker students were helped the most, confirming a trend observed in earlier, smaller-scale CAI experiments.

The improved performance by the weaker students probably results from the fact that the CAI system causes the student to work until he masters the material. It guides him toward a correct answer by supplying "feedback" in the form of comments showing which parts of his response need correction enabling him to see immediately where he had gone wrong.

The CAI experiment, one of the largest ones ever undertaken, was carried out at Stony Brook under the supervision of Prof. Edward Lambé, director of the Institute for Research on Learning and Instruction and of the university's Instructional Resources Center. The project was directed by Dr. E.N. Adams, IBM, and carried out by him and other members of the German Department. The experimental design and analysis was the responsibility of Dr. H.W. Morrison of the Psychology Department. The IBM research group, directed by Dr. Adams, prepared the programs and made various technical contributions to the experiment. Prof. Rupin and Prof. John Russell of the German Department have prepared programs independently for use in teaching all first-year German students.

The findings of the CAI experiment at Stony Brook represent the latest result of a series of pilot tests and field evaluations that have been conducted over the last three years.

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CAI Tested at Naval Academy

An experimental computer-assisted instruction system is being used at the U.S. Naval Academy to teach Russian, fluid dynamics, physics, and thermodynamics to 150 midshipmen. Each of the 12 study carrels has a CRT terminal and a slide projection unit, both operated by the central computer of the IBM 1500 Instruction System.

School President Says

'Vast Pool' of EDP Talent Overlooked

NEW YORK — The number of available data processing personnel still is steadily slipping behind the rapid pace of the computer industry and the gap is likely to widen this year, according to Sidney Davis, president of Electronic Computer Programming Institute.

Davis estimated that at least 25,000 computer programming jobs went begging last year for lack of qualified people to fill them. He pointed out that this occurred despite the training of 40,000 programmers by schools during the last 12 months.

"Unless vigorous action is taken by the data processing industry," Davis said, "the personnel gap will widen in 1969. If present conditions continue, I foresee a minimum of 45,000 unfilled programming jobs this year."

He said that in 1968 more than 18,000 computers were installed in the U.S. bringing the number of computers in operation to 70,000. These were staffed by 280,000 programmers and 120,000 systems analysts and data processing managers. In 1969, Davis predicts that additional computer installations will require at least 60,000 more programmers and 30,000 systems analysts and data processing managers.

"The full dimensions of this growing personnel gap become clearer when we realize that new data processing installations now require at the ranks of experienced systems analysts and new systems analysts develop from experienced programmers. This means that the number of new programmers needed to replace those who are promoted to greater responsibilities further increases the number of entry-level programmers that must be trained."

"To meet this critical programmer shortage, many com-

puter users will have to change their dogmatic approach requiring a college degree for programming work. If they'll only look around, they'll discover vast pools of highly qualified clerical and administrative people already in their employ who have tough school educations. Experience shows that these are often outstanding candidates for DP training."

Private Computer School Opening New Branch

NEWARK, N.J. — Private and Computer Schools is opening a new installation in Bala Cynwyd, Pa. this month.

"Programming and Systems Institute of Camden/Philadelphia has 4,500 square feet of office and classroom space and is designed to meet the pressing need for trained computer operators in the Philadelphia area," said Robert Kueber, secretary of the company.

The company's other computer schools are located in New Jersey in Newark, Hackensack, Dover, and Cherry Hill.

University Wins New Computer

DALLAS — The University of Pittsburgh School of Engineering will be given a Model 4700 computer by Scientific Control Corp. as the result of a contest. Scientific Control introduced the computer at the Fall Joint Computer Conference in San Francisco. Conference attendees were given the opportunity to win the computer and donate it to the university of their choice. W.B. Jones, a member of Computer Science Corp.'s technical staff in El Segundo, Calif., won the computer and selected the University of Pittsburgh to receive it. The computer is valued at \$16,500.

University of Montreal 'Weights' Courses by EDP

MONTREAL — The University of Montreal, recognizing that all courses taken by a student do not have equal value to him, "weights" its courses on a computer. Students sign up for courses and then the faculty determines a "weighting factor" for each based upon its value to the student.

For example, chemistry probably is more important to a medical student than English literature and so is given a larger weighting factor.

All marks from tests and examinations are fed to the Honeywell 200 system and then multiplied by the weighting factor for each course. The computer uses the "weighted" grades to determine an over-all mean average for each student and the student wins his degree by attaining a passing mean average of 60.

College Purchases Data Accumulator

NEW BRUNSWICK, N.J. — The Rutgers College of Engineering has purchased a Gluton Automatic Microscope Electronic Data Accumulator (Ameda). The system, when tied to a digital computer, will be used to further studies of automation in pathology.

The Rutgers electrical engineering department activities in the area of biomedical engineering have been carried out in conjunction with the Institute of Laboratory Medicine of Perin Amboy General Hospital.

The system scans slides optically and provides digital readings of numbers of particles in different size groups. It can provide 100,000 to 1,000,000 observations in less than 22 minutes with more accuracy and far greater speed than has been possible in the past, the college said.

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Joint Symposium Planned On Information Theory

ELLENVILLE, N.Y. — The 1969 Information Symposium on Information Theory will be held at the Navel Country Club here Jan. 28-31.

The symposium, sponsored by the Information Theory Group, IEEE, and Commission 6, Union Radio Scientifique Internationale, will consist of 15 sessions of contributed papers.

The purpose of the symposium is to provide a forum for dissemination of recent advances in the

many areas of information theory, prediction of filtering theory, pattern recognition, and learning systems.

The symposium's international aspects will be heightened by speakers from Australia, Belgium, Brazil, Canada, Denmark, England, France, Israel, Italy, Japan, and Sweden.

The registration fee is \$25 for members of the two associations, \$10 for student members, and \$30 for nonmembers.

System Sciences Conference Set

HONOLULU — The Second Hawaii International Conference on System Sciences will be held at the University of Hawaii Jan. 22-24.

The conference, consisting of 37 technical sessions, will be sponsored by the university's Electrical Engineering Department and the Information Sciences Program of the College of Engineering.

Supporting organizations include the Office of Naval Research and the Air Force Office of Scientific Research.

Cooperating groups include four IEEE groups, the Hawaii Section of the IEEE, the IEEE Cedar Committee, the ACM, and the Society for Industrial and Applied Mathematics.

The registration fee is \$25.

'Threshold of 70s' Is FIJC Theme

LOS ANGELES — "Threshold of the 70's" will be the theme of the 1969 Fall Joint Computer Conference to be held Nov. 18, 19, and 20 at the Las Vegas Convention Center.

Jerry L. Koory of Programmatic, named general chairman, has announced the formation of the conference steering committee.

Ted Braun, Applied Technology Corp., is vice chairman; Michael Burn, System Development Corp., treasurer; Nancy M. Stringer, Programmatic, sec-

retary. Committee chairmen are Eugene M. Grabbe, TRW Systems Group, technical program; Frank F. Jurkovich, Applied Computer Technology Corp., registration; Al Deutch, Associated Aero Sciences, local arrangements; Robert B. Forest, Datamation, public relations; Robert L. Koppel, Autometics, printing and mailing; Samuel F. Needham TRW Systems Group, exhibits; Fred Gruenberger, San Fernando Valley State College, education; W.S. Dorsey, Autometics, special activities; and Ann Rataichak, IBM, ladies activities.

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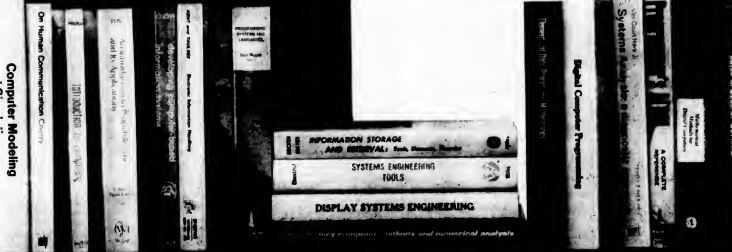
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Mental Health Applications Study Set

PROVIDENCE, R.I. — A group of Rhode Island businessmen, educators, and community leaders have formed a private, nonprofit organization to study the possible uses of the computer in the field of mental health, and, if feasible, to initiate an action program.

CAI for the Retarded

One of the first objectives of the committee will be to establish a Rhode Island based program for computer-assisted instruction of retarded children. The directors of the J. Arthur Trudeau Memorial Center for Retarded Children in Warwick, R.I., have offered their facilities to the committee to help in the project.

A second objective of the committee will be to establish a program for the application of the computer to the diagnosis and treatment of all types of mental illness.

Robert E. Radican, president of Robert

E. Radican and Co., Providence, will serve as acting chairman of the committee until an organizational meeting later this month. The Rev. George C. McGregor, director of the Clinton Job Corps Center in Clinton, Iowa, and one of the country's leading educators in the computer field, will serve as full-time project manager.

The first phase of the committee's

project will be primarily in research and will include the investigation of all programs now in progress involving the use of a computer in the field of mental health. It is estimated that this phase of the program will take three to six months and will cost approximately \$10,000.

Members of the committee are presently conducting a fund raising effort and proposals will be submitted to state and

federal agencies, foundations, and private organizations. Members of the President's Committee on Mental Retardation have already expressed an interest in the program.

The project will be dedicated to the memory of the late John E. Fogarty, a Rhode Island congressman, who for many years fought for improvement of the health of the nation.

GE to Offer Time-Sharing, Batching on GE-600s

WASHINGTON, D.C. — General Electric has announced a new service called Resource that utilizes the capabilities of its large-scale GE-600 information systems.

Through the Resource plan, users will be able to obtain the services of a GE-owned and operated GE-600 system

Services

at a fraction of the cost of a complete system.

The same full range of capabilities will be available although the percentage of

the system used can be regulated to accommodate specific needs.

Local batch, remote batch, and time-sharing modes will be possible. Local batch processing may be executed at the GE-600 site.

Remote batch processing may be accomplished through a low-cost GE-115 information system or teletypewriters on the user's premises connected to the GE-600 by telephone lines.

Time-sharing service can be provided simply by installing teletypewriter terminals at whatever sites the user wishes. Resource will be available initially only in the Washington, D.C., Philadelphia area, although customers from outside this region may contract for the service if they assume the additional communications charges.

Full services will be in operation after May 15, although demand batch processing will be ready March 15.

Data Conversion Service To Use Unique Equipment

LEONIA, N.J. — A new corporation, Compuscan, Inc., will specialize in the conversion of graphical and printed data into digital form for computer entry, and the manufacture of data conversion equipment for input to or output from computers.

Initially, in facilities located here, Compuscan will operate a service bureau to convert graphical, printed, type-written, or hand-prepared data to magnetic tape.

The new data processing service will utilize a new optical scanner designed and built by the company. It provides data conversion at speeds hundreds of times faster than currently available equipment, with exceptional accuracy, according to the company.

Lawyer Service Working

NEW YORK — Omega Data Systems, Inc., a data processing subsidiary of Kinney National Services, Inc., has announced that the Attorney Information Control System is now in operation.

The system records all facts associated with utilization of lawyers' time and all fees and costs associated with their respective clients and matters. A company spokesman stated that these computer generated reports can be considered a major breakthrough in automated record keeping for the substantial law firm and represents the most sophisticated and comprehensive solution in solving the dilemma of uncollected fees and costs, an area which is costing sizeable law firms thousands of dollars each month.

Time-Sharing Offered in Philadelphia Area

PHILADELPHIA — Community Computer Corp., a time-sharing company, is providing computer services through standard phone lines in the Philadelphia area. The computer equipment, manufactured by Hewlett-Packard, will allow a number of users to access the company simultaneously.

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Airport Fuel Pipelines 'Controlled by Computer

NEW YORK — A large fleet of tank trucks which rumbled back and forth from the bulk supply area to airline terminals at Kennedy International Airport has largely been replaced by a computerized underground fuel system.

Fuel as required is pumped from a large bulk storage area to a satellite, or intermediate, storage area, under the close control of a General Electric 412 process computer system.

In the \$20-million tank and piping system the computer continually determines the needs of 40 satellite storage tanks located about midway between bulk storage tanks and the airline terminals. When completely filled these tanks contain nearly four million gallons of fuel.

Jet planes are fueled directly from the satellite system by a network of underground fuel lines that terminate at hydrants in the pavement, thus reducing the movement of the fleet of tank trucks which formerly swelled the amount of vehicular traffic at the airport.

The complete transfer and supply system is maintained and operated by the Allied New York Services, Inc., a subsidiary of Allied Maintenance Corp., an international service organization. General Electric maintains the GE-supplied portion of the data and control system, including the computer.

The computer scans the satellite tanks to determine their needs, then chooses a bulk supply tank or group of airlines in need of fuel, and activates pumps to supply this need through one of the five piping systems.

Besides directing the operation of simultaneous fuel-transfer through all lines of the system, the computer monitors the system for malfunctions. When it finds a discrepancy in operation, it types out a warning.

Should a condition arise where more than one airline is in immediate need of fuel, the computer directs the system to provide 5000-gallon increments sequentially.

Computer Aids Toll Collection

SAN FRANCISCO — The motoring public won't notice any immediate difference, but a computer has been put to work on the Golden Gate Bridge. The system eventually will take over all registry procedures needed to keep track of the 10 types of fares collected at the bridge.

"We don't yet know enough about all the computer's possibilities in this field to make firm plans past the first few steps," explained Robert E. Shields, engineer of the Golden Gate Bridge and Highway District.

As before, the attendant still collects money as each vehicle reaches the toll island. The IBM 1800 system tabulates each fare, pass, and coupon as the collector records it.

"We hope one day to set up an advance-warning system with sensing devices at selected intersections tied into the computer," Shields said.

"Such a system could tell us, for instance, when to expect a heavy crush of football traffic, and we could have our optional lane ready for the extra load." The optional lane is one taken from the lightly traveled side and added to the side encountering heavy traffic.

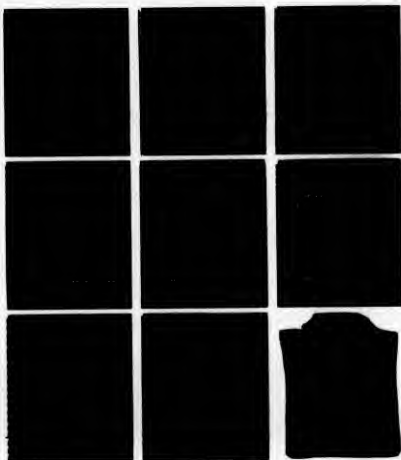
Another proposed computer function is automatic vehicle detection, a system that would subtract each day's fare from a prepaid monthly toll. The computer would "recognize" an electronic device attached to the car and deduct the toll from the proper account — and the driver wouldn't even slow down.

ally into each low tank until the emergency has been overcome. Then the computer resumes large-volume transfer operations.

To complicate matters, each two-mile pipeline contains a so-called line-fill of fuel which must be placed in the proper airline tank before a new demand can be met from a different airline or airlines group. The computer system has been programmed so that up to 27 supplier grades of fuel can be transferred to nine groups of airlines at Kennedy. Bonded fuel for overseas flights is also involved and must be handled on a segregated basis. Changes in contract arrangements between supplier and airlines are reflected in the control system by changing the position of pins in a matrix pin board developed by New York Port Authority and GE designers.

Howard Blake, standing, supervisor for Allied New York Services, and Bernard Sonenshein, a GE control specialist, confer on the new system.

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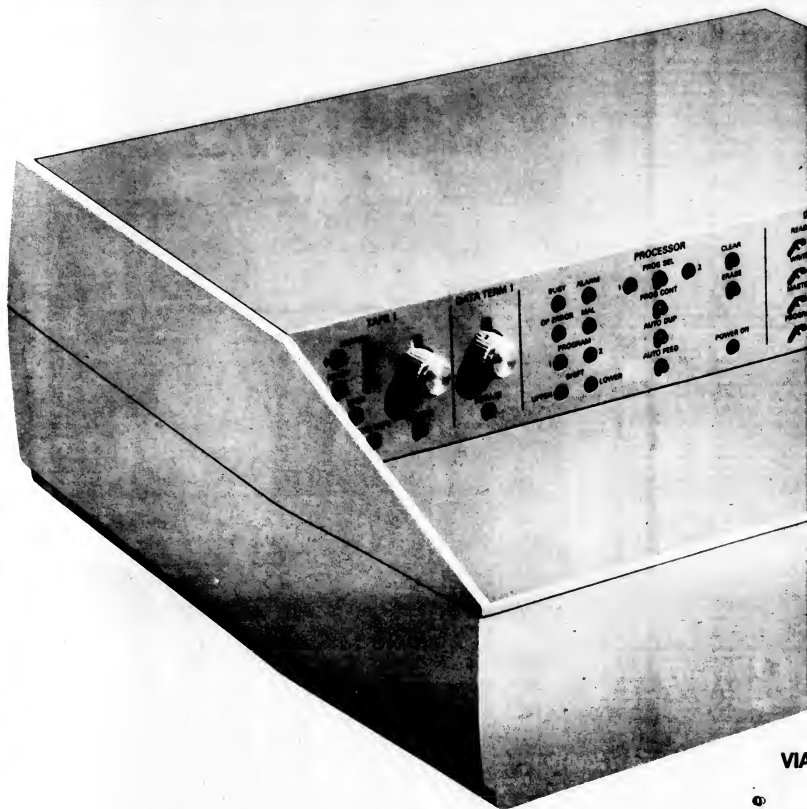
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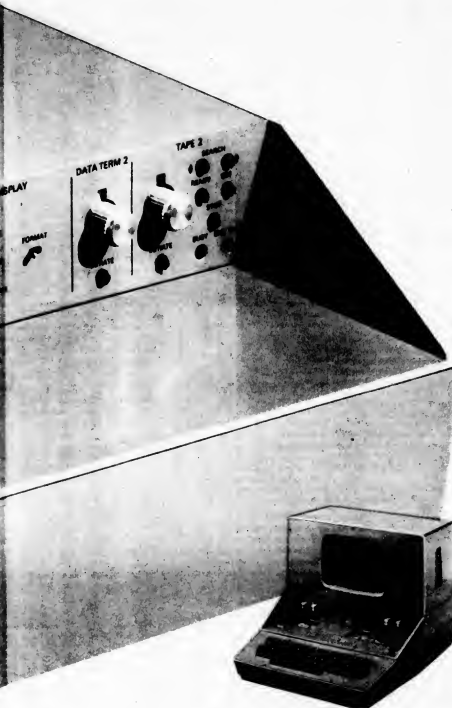
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For example, a complete System 21 data entry station costs \$39-a-month. It consists of the microprocessor, keyboard, storage and data channels, two VIATAPE recorders and a video display.

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Preparing data for card, tape or on-line computer input becomes simply a matter of filling in the blanks. The microprocessor contains all the logic needed to display any input format together with the data record you are writing on the video screen.

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As each format is completed, data entries are recorded on a second VIATAPE cartridge. These records can then be automatically translated to error-free punched cards or IBM-compatible tape, or fed directly to your computer.

VIATRON System 21 input stations can be put on any desk in any location. No computer environment is required or needed. Operations can start as soon as your equipment is delivered. No software is required. And, anyone can operate System 21 without special training. VIATRON's "fill-in-the-blanks" formatting takes the mystery out of computer input.

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The applications of System 21 are in no way confined to preparing computer input. Once data has been recorded on VIATAPE at one System 21 station it can be displayed or edited at any other System 21 station. Data can be transmitted from one System 21 station to another over regular telephone lines. Hard copies can be printed.

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Saving and Loan System Available in Fortran IV

ALBUQUERQUE, N.M. — A new system for savings and loan associations has been developed by the Dikewood Corp.

The automated savings and loan system provides extensive analytical reports and meets all the requirements of the Federal Reserve Board, according to the company. It also will be available for banks, finance companies, credit unions, and service bureaus performing work for such organizations.

The system is divided into two parts. The first part handles savings accounts and the second part handles loan accounts. The parts are available separately.

The savings system provides such features as transaction proof journals, account trial balances, dividend checks or notices, dividend summary reports, savings account analyses, 1099s, and an audit trail. The loan system provides loan maintenance lists, transaction proof journals, receipt and next payment notices, delinquency notices, collection notices, and various distribution reports.

The system is written in S/360 Fortran IV and is currently running on a Model 44. The prices on the two parts of the system are: Part I — \$1500, Part II — \$5500.

Cogo-90 Is Now Available In Time-Sharing Version

PRINCETON, N.J. — Cogo-10, a time-sharing version of Cogo-90, the civil engineering problem-oriented language, is now available from Applied Logic Corp. through its AI/Com associates subsidiary. Requiring no previous computer knowledge, the language can be used both in the office and on the job for rapid problem solution, according to a company spokesman.

The language provides a system for coordinate geometry solutions for geometric problems in control, land and right-of-way surveys, highway design, construction layout, and bridge geometry, the spokesman said.

The programs can be written quickly, and the size of the computer does not limit the program size. The program provides capabilities for the engineer to use and save coordinates for up to 999 points as well as calculated distances and angles.

Output format control permits high readability of output reports, and simple annotation to the input data.

The system is accessible through a nationwide telephone tie-in to the computer here and is charged for on a usage basis.

PI/I Will Be Offered for 360/20

WHITE PLAINS, N.Y. — PI/I will be available for users of the 360/20 in the second quarter of 1970, according to IBM. The PI/I language will be made available in a 16K version, disk resident, and will operate under

the Disk Programming System monitor.

The language "offers Model 20 users an efficient means of programming commercial, scientific, and engineering applications in the same language," IBM said.

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Two shares of Computer Industries common stock would be exchanged for each three shares of Computer Leasing common. University Computing owns 60% of Computer Leasing, a Washington, D.C., leasing and financing company, and 80% of Computer

Industries, a Van Nuys manufacturer of high-speed remote computer terminals.

The acquisition requires approval by stockholders of both companies. University Computing said it would approve.

Computer Industries indicated that, if the plan to acquire Computer Leasing succeeds, Robert D. Holland, Computer Leasing president, would become Computer Industries chairman.

Robert G. Dee will continue as Computer Industries president and chief operating officer.

Five-Year Industry Growth Second Only to Aerospace

NEW YORK—The information processing industry was second in growth over the past five years only to the aerospace and defense industry, according to *Forbes 21st Annual Report on American Industry*.

Despite its glamor image, the industry ranks only sixth in five-year return on equity among 23 separate categories in the *Forbes* survey.

These ranks were computed from a list of 500 of the major and largest publicly held U.S. corporations.

Companies included under information processing were, in order of a five-year average return on stockholders' equity: Xerox, IBM, RCA, General Elec-

tric, Addressograph-Multigraph Corp., Honeywell, Harris Inter-type, Burroughs, NCR, Sperry Rand, Control Data, and SCM Corp.

SCM led in the five-year increase on sales followed by Control Data and Xerox.

The best five-year annual increase in per-share earnings went decisively to Control Data with a 42% increase.

Among the 500 firms in "Who's Who in the Stock Market," a ranking by earnings growth trend, the computer-associated stocks were: Leasco Data Processing, I; Burroughs, 8; Raytheon, 36; SCM Corp., 62; Xerox, 78; Collins Radio, 85; IBM, 138; Sperry Rand, 153.

Control Data, 161; ITT, 173; NCR, 250; RCA, 251; Honeywell, 253; Addressograph-Multigraph, 318; General Electric, 395; and Greyhound, 402.

Forbes estimates the really big money in data processing will be in software rather than hardware over the next several years.

It forecasts about \$4.5 billion for software vs. \$3.1 billion in hardware for 1969 vs. \$5.5 billion vs. \$3.2 billion in 1970, \$5.9 billion vs. \$3.7 billion in 1971, and a doubling to \$7.4 billion over \$3.7 billion in 1972.

New Firm to Develop

Compatible Disk Files

ANAHEIM, Calif.—Century Data Systems, a newly formed digital equipment manufacturer located at 1555 W. Broadway here, will emphasize the development of disk file systems compatible with major mainframe computer systems.

Century Data will market its products to original equipment manufacturers and third party leasing companies. California Computer Products, Inc., which supplied initial financing, will handle direct sales, leasing, and service to computer users.

Programming Services

Gets New Name

WOODLAND HILLS, Calif.—Information General Corp., the new name of Programming Services, Inc., has been approved by the shareholders.

"The new name more adequately reflects the capabilities of the company and its expanding activities in the information field," according to Don Ford, president and founder.



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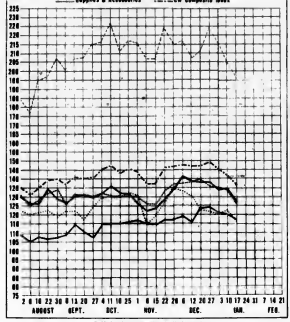
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Computer Stocks Trading Index

Computer Systems
Peripherals & Subsystems
Supplies & Accessories

Software & EDP Services
Leasing Companies
CW Composite Index



Only 6 CW Stocks Gain as 92 Fall

Stock prices continued to decline during the week ended Jan. 14. The Computerworld composite stock index fell 7 points (4.20%) to 137 while the Dow Jones industrial average dropped 26 points (2.77%) to 925.53.

The Dow suffered its largest loss in a year and a half on Monday. The 15-point one-day loss was equal to the total loss suffered by the index in the previous two weeks.

The Dow fell another 11 points Tuesday, when many banks hiked their prime interest rate to 7%. A four-point loss on Wednesday, making a total loss of 30 points in three days, was followed by a technical rally on Thursday which added 6 points.

The rally faltered Friday when the Dow lost 2 points.

Brokers anticipate a nervous market period ahead with stock prices vulnerable to renewed selling pressure, which may easily build up in the new Friday trading weeks. Most analysts feel another test of buying sentiment will come at the 920 level of the Dow, and possibly even below that, at the 900 level.

Loosers outnumbered gainers 92 to 6 among Computerworld

listed stocks, with 7 remaining

up. Fifteen stocks lost 10% or

more while only one made a

significant gain.

Software & Services

The Software & EDP Services sector, down 9 (4.39%) to 196, contained 8 of the large losers. Datacube, down 3 (18.75%), suffered the largest loss in the sector for the third straight week. Computer Environment's

and Strategic Systems both lost 11% while Advanced Computer Techniques was 10% lower. Computer Sciences, up 3 (4.32%), made the largest gain in the sector. Aries rose 1/2 (2.86%) and Computing & Software added 1/4 (0.32%).

Scan-Data's 25-point (29.41%) loss was the largest of the week. Both Migo Electronics and Migo Data Sciences lost 10%. Migo had added 16% in the previous two-week period. Fabri-Tek was the only stock in the Peripherals & Subsystems sector not to lose ground. Fabri-Tek remained even for the week. The sector index was down 9 (6.67%) to 126.

Leasing Sector

The Leasing sector, off 5 (4.10%) to 137, also had three large losers. Continental Computer and Lectro Computer Leasing both lost 15%, and NCC Exchange made the largest gain among Computerworld listed stocks, rising 1-1/2 (11.11%) to 15.

Digital Equipment's 17-1/2 point (10.12%) loss was the only large one in the Computer Systems sector, which was off 8 (5.93%). IBM dropped 9-1/2 points Monday to close at 302-1/2, following disclosure of the Data Processing Financial & General antitrust suit brought against it. It regained some of this loss during the week and closed at 305-3/4, down 5-1/4 (2%). Honeywell's 1-1/2 (1.33%) loss was the smallest in the sector.

Supplies & Accessories

The Supplies & Accessories sector, with no large gainers or losers, suffered the smallest loss of all five sectors. Its index was off 2 (1.37%) to 118.

COMPUTER STOCKS: TRADING SUMMARY

Two Weeks Ended January 3

EXCHANGE	BASE PRICE	1968-69 CLOSING	PERCENTAGE	COMPUTER SYSTEMS	WEEK NET	WEEK % CHANGE	CHANGE FROM BASE
3-1/8	1968-69 CLOSING	3-1/8	1968-69 CLOSING				
NYSE	163 3/8	253-197	273 5/8	Burroughs	-12 7/8	-5.44	+36.88
NYSE	87 3/4	310-54	345	Collins Radio	-3 3/8	-5.84	+32.45
NYSE	101 1/2	174-184	198 3/8	Control Data	-9 3/4	-6.85	+30.67
NYSE	103 1/2	177-187	195 1/2	Digital Equipment	-1 1/2	-1.12	+32.45
NYSE	18 1/8	27-16	21 3/4	Electronic Assoc.	-1 3/8	-6.01	+12.42
NYSE	67 1/4	100-81	90 1/2	General Electric	-5 1/4	-5.48	+3.72
NYSE	60	91-59	79 1/8	Hewlett-Packard	-3 7/8	-4.67	+31.87
NYSE	93 1/8	144-69	111 1/2	Honeywell	-1 1/2	-1.33	+19.73
NYSE	266 1/2	370-260	305 3/4	IBM	-1 1/4	-0.50	+5.94
NYSE	103 7/8	153-40	110 3/8	NEC	-6 5/8	-5.66	+6.26
NYSE	46 7/8	53-44	45 3/4	RAI	-1 3/4	-3.69	+2.40
NYSE	39 1/8	53-44	45 3/4	Sci. Control Corp.	-3 3/8	-7.78	+7.78
OTC	22 1/2	66-20	40	Scientific Data	-7 1/8	-8.89	+8.89
NYSE	45	63-42	46	Sperdy Rand	-3 1/4	-6.60	+2.22
NYSE	52 1/2	39-26	48 1/2	Systems Eng. Lab.	-1 1/2	-1.73	+26.67
EXCHANGE	BASE PRICE	1968-69 CLOSING	PERCENTAGE	PERIPHERALS & SUBSYSTEMS	WEEK NET	WEEK % CHANGE	CHANGE FROM BASE
3-1/8	1968-69 CLOSING	3-1/8	1968-69 CLOSING				
NYSE	58 3/8	91-59	66	Addressograph-Multigraph	-4 6/8	-8.55	+13.06
NYSE	23	85-42	63 1/2	Alphanumeric	-7	-9.53	+20.03
NYSE	26	41-26	35 3/4	Ampex	-3 1/8	-8.04	+23.27
OTC	17 1/4	27-14	16 1/4	Bart. Barank & Newman	-1 1/2	-8.22	+16.92
NYSE	13 1/2	27-14	16 1/4	Bunker-Ramo	-7/8	-5.26	+18.32
NYSE	32 1/8	50-27	33 7/8	CalComp	-2 3/4	-7.51	+5.45
OTC	20 1/2	20-12	18 1/2	Comptronics	-1 3/8	-6.72	+48.08
OTC	12	18-10	14 3/4	Computer Equipment	-1 1/4	-7.81	+22.92
NYSE	15 1/4	25-13	16 1/2	Data Products	-1 5/8	-6.37	+56.56
OTC	19 1/4	27-16	20 1/2	Digimatrix	-2	-8.89	+5.00
OTC	36	67-32	54 1/2	Electronic Memories	-1 1/2	-2.68	+39.74
OTC	20	20-9	12 1/2	Fab-Tek	-2	-12.05	+6.63
OTC	20 5/8	65-16	33 1/4	Farrington Mfg.	-1 1/2	-7.52	+22.00
OTC	12 1/2	17-12	14 1/2	Information Displays	-1 1/2	-12.32	+22.00
NYSE	16 7/8	52-14	18 1/2	Micro Electronics	-1 1/2	-10.24	+28.49
NYSE	57 1/2	108-54	61 5/8	Moheaw Data Sciences	-7	-10.20	+7.17
OTC	18	42-16	26	Optical	-3/4	-2.61	+55.95
NYSE	75 1/8	98-42	85 1/8	Peter Instrument	-6	-7.90	+73.91
OTC	40 1/4	99-38	70	Recognition Equipment	-5/8	-2.84	+32.59
NYSE	46	68-42	65 1/8	Raxon Electronics	-1/4	-0.44	+21.90
OTC	47	155-53	60	Sany Corp.	-25	-26.41	+27.66
OTC	40 1/2	51-34	42 1/2	Scan-Data	-2	-5.00	+17.29
NYSE	242 1/4	321-228	252 1/4	Telex	-12	-5.00	+1.13
EXCHANGE	BASE PRICE	1968-69 CLOSING	PERCENTAGE	SUPPLIES & ACCESSORIES	WEEK NET	WEEK % CHANGE	CHANGE FROM BASE
3-1/8	1968-69 CLOSING	3-1/8	1968-69 CLOSING				
OTC	48 1/4	64-33	43 1/2	Acme Vibri	-1 1/2	-1.11	+10.31
NYSE	29 1/2	32-18	20 3/8	Agam-IBM	-1 1/8	-0.60	+1.83
NYSE	11 5/8	14-10	12 1/2	Baltimore Business	-1 1/2	-1.17	+10.00
NYSE	21	44-21	26 3/4	Berry Whip	-2 1/4	-7.71	0.94
OTC	34	40-21	34 1/2	Data Communications	-1 1/2	-4.23	+1.41
OTC	27 1/4	44-25	29 1/2	Ennis Business Forms	-1/2	-1.71	+44.90
NYSE	88 1/8	119-81	100 1/2	3M Company	-2 1/2	-2.41	+19.40
NYSE	56	68-42	65 1/8	Memorex	-3 1/2	-6.16	+1.34
OTC	27 1/4	32-18	20 3/8	Moore Business Forms	-3/4	-2.24	+20.14
NYSE	34 1/4	44-25	34 1/2	Nashua Corp.	-1 1/2	-4.59	+1.94
OTC	31 1/8	36-40	45	Reynolds & Reynolds	-3	-8.25	+44.00
OTC	34 1/2	35-24	25 3/8	Standard Record	-3/4	-2.66	+20.29
NYSE	37 3/4	44-25	34 1/2	Unarco	-1	-2.63	+12.53
NYSE	14 1/4	23-13	15 1/8	Washam Magnetics	-1	-3.10	+30.70
OTC	26 3/4	37-24	28 1/2	Waltex Business Forms	-1	-3.70	+1.33
EXCHANGE	BASE PRICE	1968-69 CLOSING	PERCENTAGE	SOFTWARE & EDP SERVICES	WEEK NET	WEEK % CHANGE	CHANGE FROM BASE
3-1/8	1968-69 CLOSING	3-1/8	1968-69 CLOSING				
OTC	7 1/2	25-7	13	Advanced Computer Techniques	-1 1/2	-10.35	+73.33
OTC	17	36-14	34	Applied Data Research	-1 1/2	-1.51	+100.00
NYSE	19 1/2	23-13	18	Auratic	+1/2	+2.86	+16.13
NYSE	47	75-42	65 1/4	Automatic Data Processing	-1 1/8	-1.66	+25.89
NYSE	4	19-4	12 1/4	Automation Systems	-1	-7.55	+206.25
OTC	4 1/2	23-13	18	Brandon Applied Systems	-2	-12.12	+227.27
NYSE	28 7/8	43-19	30 1/2	Computer Applications	-7/8	-1.12	+10.93
NYSE	5	15-7	11	Computer Environments	-2 1/2	-16.52	+120.00
OTC	30	61-44	46	Computer Network	-4	-6.00	+43.33
NYSE	30	64-36	57 3/8	Computer Science	+2 3/8	+4.32	+43.44
NYSE	39	62-38	35	Computer Usage	-3	-7.69	+10.26
NYSE	18 1/2	63-36	76 1/4	Computing & Software	-4	-5.32	+117.12
OTC	12 1/2	26-5	20 1/2	Datamation Services	-3 1/2	-14.58	+84.00
OTC	12	22-10	13	Delata	-2	-16.75	+16.35
NYSE	12 1/2	20-10	13 1/4	Digilog	-2	-14.04	+2.00
NYSE	38 3/8	52-26	29	Electronic Computer Prog. Inst.	-2 5/8	-6.30	+24.42
OTC	17 1/2	24-15	22 1/2	Informatics	-1	-5.88	+11.11
OTC	21	26-4	18 1/2	Matrix Corp.	-1	-5.13	-11.91
NYSE	31	26-19	24	National Computer Analysts	-5 1/8	-8.60	+73.81
NYSE	41 1/4	61-29	47 1/2	Planning Research	-3/4	-1.68	+24.53
OTC	41 3/4	115-10	10	Programmatic & Systems	-3/4	-5.88	+24.53
NYSE	18	26-15	17 1/2	Software Systems	-1	-5.56	+45.67
OTC	42 1/2	44-8	33	Strategic Systems	-4	-10.81	+11.86
NYSE	9 1/2	22-10	12 1/2	Tek Computing Centers, Inc.	-1	-7.41	+26.02
NYSE	41 1/2	61-29	47 1/2	United Data Systems	-7	-16.83	+26.83
OTC	63	182-57	148	University Computing	-7	-4.52	+124.92
NYSE	40	34-25	32 1/2	URS Systems Corp.	-2 1/2	-6.25	+12.50
OTC	430	430-19	18 1/2	U.S. Time-Sharing	-1 1/2	-1.74	+35.00
EXCHANGE	BASE PRICE	1968-69 CLOSING	PERCENTAGE	LEASING COMPANIES	WEEK NET	WEEK % CHANGE	CHANGE FROM BASE
3-1/8	1968-69 CLOSING	3-1/8	1968-69 CLOSING				
OTC	4 1/4	24-4	15	Boome Computer	+1 1/2	+11.11	+425.24
NYSE	18 1/8	36-21	26 1/8	Computer Exchange	+1 1/4	+5.02	+2.88
NYSE	41 3/8	58-28	48 1/2	Computer Leasing	-2 1/4	-5.82	+2.07
OTC	12 1/4	19-11	12	Continental Computer	-1/8	-1.03	+5.05
NYSE	106 1/2	150-98	125 1/2	Cyber-Tronics	-1/8	-0.78	+2.08
OTC	20	24-15	15	Data Proc. Financial & General	-1	-5.00	+40.00
OTC	25	34-15	15	Detronic Rental	-1	-4.00	+40.00
OTC	20	24-15	15	Devaron Computer	-3	-6.38	+126.00
OTC	13 1/4	19-11	12	DPA, Inc.	-3 7/8	-5.83	+45.67
NYSE	28 3/4	43-25	34 1/2	Groundwood Computer	-2 3/8	-8.30	+8.70
NYSE	28 1/8	34-25	32 1/2	Groundwood Equipment Leasing	-1 1/2	-5.36	+11.11
NYSE	40	139-41	125	Lanico	-1/4	-0.20	+135.10
OTC	5	14-5	7	Lectro Computer Leasing	-1 1/4	-15.15	+40.00
NYSE	40	46-27	42 1/2	Levin-Tow-Ind Computer Corp.	-1 1/4	-3.57	+33.33
NYSE	10 1/2	18-7	7	LHC Data, Inc.	-1/4	-3.45	+33.33
NYSE	38 1/4	52-26	44 1/2	Levin-Tow-Ind Computer Corp.	-1 1/4	-3.57	+33.33
NYSE	41 3/8	53-25	34 1/2	National Equipment Rental	-1 5/8	-4.45	+12.22
NYSE	38 1/4	52-26	44 1/2	NCC Leasing	-1 1/4	-3.57	+33.33
NYSE	10 1/2	18-7	7	Randolph Computer Corp.	-1 1/2	-1.12	+100.00
NYSE	10 1/2	18-7	7	System 1 Corp.	-1/2	-1.12	+100.00
NYSE	10 1/2	18-7	7	System 1 Corp.	-1/2	-1.12	+100.00

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New Com-Share Southern Office Opened in Calif.

HOUSTON—Com-Share Southern, Inc., a computer time sharing complex, has expanded its operations to northern California, opening an office at 4559 Hamilton St., Palo Alto. The new office will offer time sharing services over regular telephone lines. Robert C. Smith has been appointed manager.

EDP Central Leases The Arcoa Building

PORTLAND Ore. EDP Central Inc., a computer time sharing company, has leased the



Arcoa Building, 1606 S.E. Grand Ave., for combined offices and a computer installation. According to James F. Bonbrith, president, operations are scheduled to begin in the new quarters Jan. 1.

Creative Services Forms Service Organizations

NEW YORK Creative Services, Inc. has announced the formation of Teles Scientific to operate as a service organization for computer applications, with emphasis in the area of computerized process control systems. The new division will be located at 730 Fifth Ave. Takis Demoski has been named president.

Data Sciences Opens EDP Leasing Division

NEW YORK Data Sciences Corp. has opened a new division to handle contract leasing of computers and peripheral equipment. Proprietary programs and programming services will be available with the leased equipment. Raymond C. Maloney has been appointed to head the new division.

Macs Computer Accessories Will Represent G.K.I.

RESTON, Va. Macs Computer Accessories Inc., Philadelphia, a data processing supplies firm, has been appointed sales representative in the Delaware Valley area for General Kinetics, Inc. GKI manufactures computer tape cleaning unit designed for in-house use.

Effective immediately, the minimum charge for open tape discharge is \$36.40 + 2 column inches. Advertiser may use 1 column inch but rate charged will be \$36.40.

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COMPUTER WORLD

SPECIAL SECTION

January 22, 1969

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Spotlight Falls On User Rights

The Data Processing Financial & General suit filed Jan. 3 asks the U.S. Court to divide IBM into four independent commercial companies—IBM itself, the Leasing Corp., the Software Corp., and the Maintenance Corp. Unlike Control Data Corp. (which basically seeks relief for a competitive manufacturer of computer hardware), DPF&G seeks relief as a user and, in particular, asks for its rights as a user to be recognized by the court and asks that any proven violations of the 1956 consent decree be stopped.

User Position Will Be Elucidated

Whether or not this particular contention, believed to be novel in antitrust cases, is accepted by the courts, it can be expected that the actual position of a user will become more greatly defined during the case. Because of the importance of this case to users, and because of the complexities of the issues, *Computerworld* is printing, in this special supplement, the text of the complaint, and of IBM's response to it.

Monopolies Are A Central Issue

Monopolies seem to be the main issue in the current antitrust suits against IBM.

In the DPF&G suit, DPF&G contends that IBM's monopoly position, while it may have been necessary in the early 1950s to build the market, was acquired illegally. The company further contends that, having acquired this monopoly illegally, IBM has used its monopoly position to extend itself and to restrain competition.

Certain industry groups feel that it is unkind of Control Data and DPF&G, both young companies, to attack the company that created the market for their products.

But the fact that an industry benefits from the actions of a monopoly does not, under the law, justify the continuation of these actions to the exclusion of potential competition.

A case cited by DPF&G (United States vs. *Jeannot Electronics*) pointed out that while the defendant's practice of incorporating maintenance as part of an agreement between the customer and the company may have been valid when the company first started, current market conditions no longer warranted such agreements. They are to be considered as actions in restraint of trade.

When there is no effective competition, it is fine to offer price services with a product, but when the time comes that there is effective competition, it is not valid to continue policies of this type when they act to throttle this competition.

There is nothing inherently wrong with being a monopoly. But the means by which it was created and by which it perpetuates itself can be questioned.

DPF&G's Suit Might Result In Immediate User Benefits

By Peter L. Briggs

Staff writer

The antitrust suit lodged against IBM by Data Processing Financial & General may result in several immediate benefits to customers of IBM and other companies which sell and rent computers.

Increased Awareness

Customers who read the brief will be more aware of possible pitfalls when salesmen call on them. They may have a better insight into possible machinations as well as more inclination to fully understand the details of offers.

Knowledge of the practices alleged in the suit (e.g., "coercion and intimidation") may cause users to be more cynical and more insistent about receiving answers to their questions.

CDC Differences

There is a distinct difference between this lawsuit and that brought against IBM by Control Data Corp. [CW, Jan. 1-8]. The CDC suit is a perfect example of the "classier" antitrust suit between manufacturers. The DPF&G suit is brought from the point of view of the user. DPF&G contends that it is protected by the antitrust laws, as well as being a beneficiary under the 1956 consent decree signed by IBM.

More Protection for Users

This viewpoint could mark another step toward giving users protection under the

law and letting users require manufacturers to deal with them on an open basis. It could, in effect, be a step toward a "Magna Carta" for users.

Lack of Information

One of the repeated allegations in the suit is that IBM "refuses and continues to refuse" to release certain types of information, such as refusing "to define the nature and extent of software to which purchasers and lessees of IBM [computers] are entitled."

If this allegation can be proven, and if such information is made available to even a small segment of the user community, the user might suddenly find himself in a position to act with the knowledge that he has the information he

needs to act in his company's best interest.

There is little doubt that full disclosure of prices would create problems for the users as well as solve some. The amount of information which would be available certainly would make it difficult for users to analyze it in any reasonable time. Study groups would have to be formed to deal with this information management problem within each company.

The basic nature of the computer industry may change, but it is almost impossible to predict what the direction of change might be. Basic marketing and sales policies, long-range goals, and customer relations are only a few areas which might be affected. This industry may bear very little resemblance to its current appearance in a year or two.

Natural Balance of Sales, Leases Upset by Quota System: DPF&G

DPF&G's charge that the IBM sales quota system upsets the natural balance between purchased and leased computers could change IBM's sales policies before the DPF&G or even the Control Data antitrust cases reach trial.

"If all IBM equipment were sold rather than leased, under IBM's present marketing compensation plan for most IBM

equipment, IBM's sales force would receive a net commission of exactly 0.00," the suit alleges.

A similar charge about the commission system is made in the Control Data antitrust suit [CW, Jan. 1-8] where it is claimed that IBM "has encouraged its salesmen to employ the marketing practices alleged... by imposing unreasonable quotas and severe penalties for the loss of orders, customers, or prospects."

Although both suits request a change in the quota system, there can be no mandatory effects until the court rules. Neither case has been tried yet, and there is no certainty that either will succeed.

Psychologically, however, the IBM sales force may find it necessary to give prospects considerably more detailed information when they make their proposals. Previously sales vs. lease recommendations may have been accepted at face value. This probably will no longer be true.

A salesman's recommendation against the purchase of a computer probably will be looked at much more searchingly by people familiar with the allegations, so it can be expected that IBM's marketing force, with its usual expertise, now will be armed with more information to support its recommendations.

New Laws Passed

British View Suit With Interest

LONDON—The news of the DPF&G case is greeted with considerable interest in London because of some new laws which recently came into force here. England does not have an equivalent of the U.S. antitrust laws, but the new acts appear to enable a user to ensure that he is not damaged by some of the trade practices to which DPF&G objects.

Hardware, Software Covered?

The acts are the *Misrepresentation Act of 1967* and the *Trade Description Act of 1968*. Primarily aimed at advertising, particularly posters, they had their first impact this month when the January sales found shops open about using the words "surplus," "reduced from," etc. However, the phrasing of the acts clearly covers other products. Dr. Colin M. Wilson, manager of U.K. sales for International Computers, Ltd. told *Computerworld* that he was fairly certain that both hardware and software came under the acts, and that he was currently investigating this question.

His first thoughts were that ICL would have to review all of its sales manuals considerably more frequently than it has in the past. The acts demand that any material made available to a purchaser or a prospect, whether or not mentioned in the contract, must be accurate. "We must

see that our manuals are kept up to date with the latest information," Wilson said.

Contract Terminations

A provision of the *Misrepresentation Act* allows the court to order that a contract remain in force even though a user has been awarded damages because the supplier failed to provide hardware or software equal to what was promised.

This provision apparently would prevent suppliers from simply offering to take back the hardware or software in question, leaving the user with the choice of accepting the unsatisfactory product or doing without it entirely.

Text of IBM Statement on Suit

ARMONK, N.Y., Jan. 3—IBM Corp. said it has not seen the formal complaint of Data Processing Financial and General Corp. but that the conditions to which DPF&G apparently now objects were in effect at the time it went into business in 1961. Furthermore, they have been the basis of the relationship between IBM and all of its customers for many years and have been well known.

Since DPF&G went into business, IBM has made several changes advantageous to

the growing number of leasing companies. Mr. Goodman has publicly applauded a number of these changes.

Last May IBM made available without charge, IBM classroom education, programming systems maintenance, and installation planning assistance for users of leasing company-owned equipment which is relocated and repaired.

In October, after IBM had announced adjustments in its maintenance prices and

(Continued on Page 2A)

Text of IFF&G Antitrust Suit

JURISDICTION AND VENUE

1. This action arises under the antitrust laws of the United States, more particularly, Sections 1 and 2 of the Act of Congress of July 2, 1890, commonly known as the Sherman Antitrust Act (15 U.S.C. Sections 1 and 2), Section 3 of the Act of Congress of October 3, 1914, commonly known as the Clayton Antitrust Act (15 U.S.C. Section 14) and Section 2 of the Clayton Antitrust Act as amended by the Robinson-Patman Act (15 U.S.C. Section 13). The jurisdiction of this Court is invoked under and is conferred by Sections 4, 12 and 16 of the Clayton Act (15 U.S.C. Sections 15, 22 and 26), 28 U.S.C. Section 1337 and the doctrine of pendent jurisdiction.

2. Defendant has its principal place of business, is to be found, and transacts business within the Southern District of New York.

3. The acts complained of have been and are being carried out in part in the Southern District of New York.

DEFINITIONS

4. As used in this complaint, the following terms have the following meanings:

(a) **Electronic data processing equipment**—A machine, or group of interconnected machines, possessing input, storage, computing, control, and output functions, which uses electronic circuitry in its central processing unit to perform arithmetic and/or logical operations automatically by means of programmed instructions. When programmed, such equipment is capable of accepting information or "input data", processing the data according to a predetermined program and providing the results in usable form. The central processing unit of a computer system and the various items which comprise equipment (such as tape drives, drum storage units, disc files and off-line printers) which are used for input, output and storage are sometimes referred to as "hardware".

(b) **Software**—All of the following categories of goods and services which under varying circumstances may be used in conjunction with electronic data processing equipment: (i) basic operations programs; (ii) applications programs; (iii) systems engineering services; and (iv) educational services.

(i) **Basic operations program**—A written sequence of instructions to electronic data processing equipment which details the operations the equipment is to perform in order to achieve a specific objective for the equipment user (such as charge account processing for a department store).

(ii) **Applications program**—A written sequence of instructions to electronic data processing equipment which details the operations the equipment is to perform in order to achieve a specific objective for the equipment user (such as charge account processing for a department store).

(iii) **Systems engineering services**—

services—services provided to evaluate and meet the problem-solving needs of users of electronic data processing equipment, including the preparation of feasibility studies; the rendition of systems analysis and design services; the planning and writing of basic operations programs and applications programs; and the debugging, testing, documentation, development and improvement of basic operations programs and applications programs.

(iv) **Educational services**—training and instruction in the use and operation of electronic data processing equipment provided to users thereof, such as on-site education, classroom instruction and educational publications.

(c) **Maintenance**—Tests, measurements, replacements, adjustments and repairs intended to keep electronic data processing equipment in satisfactory working order.

DESCRIPTION OF THE PLAINTIFF

5. Plaintiff, Data Processing Financial and General Corporation, is, and at all times relevant to the allegations of this complaint has been, a corporation duly organized and existing under the laws of the State of Delaware, having its office and principal place of business in the City, County and State of New York.

6. Plaintiff is, and at all times relevant to the allegations of this complaint has been, engaged directly and through its wholly-owned subsidiaries, primarily in the business of purchasing electronic data processing equipment and leasing such equipment to users thereof throughout the United States. Over 90% of such equipment now owned and leased by plaintiff was manufactured by defendant International Business Machines Corporation (hereinafter referred to as "IBM") and purchased by plaintiff from IBM. The aggregate price paid by plaintiff to IBM for all equipment purchased to date and now owned by plaintiff is in excess of \$170,000,000. Plaintiff also is in the business of furnishing software to end-users of electronic data processing equipment and of operating electronic data processing equipment in data centers throughout the United States. In addition, plaintiff is the United States distributor of tape drives manufactured by the Ampex Corporation.

DESCRIPTION OF THE DEFENDANT

7. Upon information and belief, IBM is, and at all times relevant to the allegations of this complaint has been, a corporation organized and existing under the laws of the State of New York having its principal place of business in Armonk, New York.

8. IBM is, and at all times relevant to the allegations of this complaint has been, the world's largest manufacturer and distributor of electronic data processing equipment and the world's largest supplier of software and maintenance for such equipment. IBM's total assets at year end 1967 were in excess of \$5.5 billion; its gross

revenues in 1967 were in excess of \$5.3 billion; its net earnings in 1967 before and after income taxes were respectively \$1.3 billion and \$652 million. Between 1958 and 1967 IBM's annual gross revenues increased by almost 400% and its annual net after tax income increased by almost 400%; during this period its pre-tax earnings were consistently in excess of 21% of its gross revenues and in some years have reached as high as 27%. Its 1967 earnings were the fourth highest of any industrial corporation in the United States. On the basis of the current market value of its common stock, IBM is considered to be worth more than any other industrial corporation in the world. IBM's revenues, income and assets are overwhelmingly attributable to its activities, carried out in interstate and foreign commerce, in the electronic data processing industry.

THE ELECTRONIC DATA PROCESSING INDUSTRY AND IBM'S MONOPOLY THEREOF

9. Since the installation in the early 1950's of the first commercial electronic data processing equipment, the manufacture and distribution of electronic data processing equipment and the supplying of software and maintenance for such equipment have become a multi-billion dollar industry. IBM has held a monopoly position in this industry since its inception. Prior to 1956 IBM refused to sell such equipment and made it available on a lease basis only. Under the terms of a consent decree entered into in 1956 in an action brought by the United States against IBM alleging monopolization of the tabulating machine industry, IBM was required to make available to the public data processing equipment available for purchase as well as lease. Subsequent thereto, various companies, including IBM, entered into the business of purchasing such equipment from IBM and leasing that equipment to end-users at rates below those charged by IBM. All such companies sold to IBM and most of the other electronic data processing equipment manufacturers only as part of a "package" which includes the full complement of software—basic operations programs, applications programs, systems engineering services and educational services. Thus the purchase price or value ascribed to electronic data processing equipment includes unascertainable sums for the various items of software which are not priced separately. The value of United States-made electronic data processing equipment currently installed, including the non-hardware elements of the package, is today approximately \$20 billion. Upon information and belief, the value of the software elements is as much as 70% of the total. As of mid-1968 there were over 60,000 installations of electronic data processing equipment; the stated purchase price of such installations ranging from less than \$25,000 to \$7.5 million, and the rental per month of such installations ranging from \$500 to \$160,000.

10. Upon information and belief, IBM has manufactured in excess of 70% of the dollar value of all electronic data processing equipment currently installed in the United States; no other manufacturer accounts for more than 7% of such equipment. These figures continue to represent the relative market shares of IBM and other manufacturers for the shipments of electronic data processing equipment. In certain critical submarkets the percentage of IBM installations is even higher. Thus, for example, 77% of those installations which manufacturers rent for between \$5,000 and \$75,000 per month were manufactured by IBM; during the six months ending in 1968 IBM equipment accounted for some 84% of the increase in electronic data

processing equipment installations in this category. The total value of installations in the \$5,000 to \$75,000 per month rental category is substantially greater than the value of all other types of electronic data processing equipment.

11. Upon information and belief, IBM has received and continues to receive in excess of 70% of the total revenue derived by all companies from software and maintenance and, in connection with certain classes of electronic data processing equipment, as much as 80% or 90% of such revenue.

OFFENSES CHARGED COUNT I

12. Continuously from or about the year 1954 to the date of the filing of this complaint IBM has violated Section 2 of the Sherman Antitrust Act by attempting to monopolize and by monopolizing the manufacture and distribution of electronic data processing equipment and the furnishing of software and maintenance to users of such equipment as follows:

(a) IBM has utilized its monopoly of the manufacture and distribution of electronic data processing equipment to attempt to monopolize and to monopolize the furnishing of software.

(b) IBM has utilized its monopoly of the manufacture and distribution of electronic data processing equipment to attempt to monopolize and to monopolize the market for maintenance of electronic data processing equipment.

(c) IBM has attempted to monopolize and has monopolized the manufacture and distribution of electronic data processing equipment by treating its rental customers more favorably than purchase customers, thereby discriminating against the users of such equipment.

(d) IBM has utilized its monopoly of maintenance of electronic data processing equipment to attempt to monopolize and to monopolize the manufacture and distribution of electronic data processing equipment.

(e) IBM has utilized its monopoly of software to attempt to monopolize and to monopolize the manufacture and distribution of electronic data processing equipment.

(f) IBM has attempted to monopolize and has monopolized the distribution of electronic data processing equipment by establishing and maintaining policies and engaging in acts and practices designed to eliminate electronic data processing equipment leasing companies as competitors, to confine such companies to a drastically reduced share of the market for the distribution of such equipment, and otherwise to prevent free and open competition with IBM by such leasing companies in the distribution of such equipment.

13. The aforesaid attempts to monopolize, monopolization and the acts, contracts, agreements and understandings which formed and continue to form a part thereof and which are being used in effectuation thereof, in violation of Sections 1 and 2 of the Sherman Antitrust Act, Section 3 of the Clayton Antitrust Act and Section 2 of the Robinson-Patman Act, as amended by the Robinson-Patman Act, are hereinafter more fully set forth and described. IBM threatens to continue and will continue the offenses herein alleged, unless the relief hereinafter prayed for is granted.

(b) IBM's utilization of its monopoly of the manufacture and distribution of electronic data processing equipment to attempt to monopolize and to monopolize the furnishing of software.

(Continued on Page 3A)

Text of IBM's Public Statement

(Continued from Page 1A)
some leasing companies reported that the adjustments would work a hardship on them because of fixed price contractual agreements with their customers, IBM withdrew them.

In mid-1967, IBM—which has long helped finance computer leasing companies through its installment payment plan—lifted its limitation on the dollar amount of debt for an individual customer. Since that time, the installment loan debt to IBM of leasing companies has more than tripled.

Most recently, on Dec. 6, 1968, IBM

announced that by no later than July 1, 1969, it expects to make changes in the way it charges for and supports its data processing equipment, which is apparent in IBM's other principal complaint.

The changes are aimed at determining what support services should be separately offered and priced to better meet the future requirements of all users of IBM equipment.

IBM comments DPF&G's allegations to be completely without merit and denies that it has violated the antitrust law. IBM said it intends to defend the suit vigorously in the courts.

Text of DPF&G Antitrust Suit Against IBM

(Continued From Page 2A)

14. Since or about 1954 IBM has failed and refused, and continues to fail and refuse, to lease any of its electronic data processing equipment except as part of a single-price package which consists of the hardware and all software—basic operations programs, applications programs, systems engineering services and educational services. Moreover, IBM has failed and refused to price separately each element of the single-price package.

15. The practices set forth in paragraph 14 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Potential competitors of IBM, including plaintiff, which have the capability of supplying software have been foreclosed from in excess of 70% of the respective markets for basic operations programs, applications programs, systems engineering services and educational services.

(ii) Lessees and purchasers of IBM electronic data processing equipment, including plaintiff, have been forced to pay for unneeded and unwanted software and to pay unreasonably high prices for electronic data processing equipment and software.

(iii) Lessees and purchasers of electronic data processing equipment, including plaintiff, have been forced to use software of substantially lower quality than is available from sources other than IBM and would be available absent IBM's exclusion of software competition.

(iv) Purchasers of IBM electronic data processing equipment, including plaintiff, have been compelled as a result of IBM's refusal to price the constituent elements of the electronic data processing equipment package separately to pay data and local storage, excise, use and personal property taxes on the price or value of the entire package, including the service or intangible property elements thereof, although such taxes are levied only with respect to tangible property.

(v) Potential competitors of IBM, which have the capability of manufacturing and distributing electronic data processing equipment but not the capability of providing software, have been foreclosed from a substantial share of the market for electronic data processing equipment, and lessees and purchasers of electronic data processing equipment, including plaintiff, have been foreclosed from obtaining electronic data processing equipment from such potential competitors of IBM.

(vi) Manufacturers of electronic data processing equipment other than IBM have found it necessary to sell and lease their electronic data processing equipment only as part of a single-price package including software, thus further foreclosing lessees and purchasers of electronic data processing equipment, including plaintiff, from obtaining basic operations programs, applications programs, systems engineering services and educational services separately on a free and open competitive basis.

(vii) Lessees and purchasers of electronic data processing equipment, including plaintiff, have been denied the benefits of free and open competition in the respective markets for electronic data processing equipment, basic operations programs, applications programs, systems engineering services and educational services.

(b) IBM's utilization of its monopoly of the manufacture and distribution of elec-

tronic data processing equipment to attempt to monopolize and to monopolize the market for maintenance of electronic data processing equipment.

16. Since or about 1954 IBM has failed and refused, and continues to fail and refuse, to lease any of its electronic data processing equipment except as part of a single-price package which includes maintenance for such equipment. Moreover, although purchasers of IBM electronic data processing equipment are not required by the terms of IBM's sales agreements to enter into IBM maintenance contracts, such purchasers (and lessees of electronic data processing equipment from such purchasers) in practice have been coerced and compelled to enter into such contracts. IBM has achieved this result, to the exclusion of virtually all competition in the maintenance market, largely through use of its absolute control over the price and availability of IBM spare parts. Thus, IBM has charged and continues to charge exorbitant prices for IBM parts to those using IBM equipment who refuse to enter into IBM maintenance agreements. IBM further discriminates against such users, for example, by giving preferences to holders of IBM maintenance contracts when filling orders for spare parts and by otherwise fixing and enforcing unreasonable terms and conditions for the delivery of spare parts.

17. The practices set forth in paragraph 16 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Potential competitors of IBM, including plaintiff, which have the capability of supplying maintenance for electronic data processing equipment, have been foreclosed from in excess of 70% of the market for such maintenance.

(ii) Purchasers of electronic data processing equipment, including plaintiff, and lessees from such purchasers have been forced to pay unreasonably high prices for such equipment.

(iii) Lessees and purchasers of electronic data processing equipment, including plaintiff, have been forced to use maintenance of substantially lower quality than is available from sources other than IBM and would be available absent IBM's exclusion of competition from the maintenance market.

(iv) Lessees and purchasers of electronic data processing equipment, including plaintiff, have been denied the benefits of free and open competition in the maintenance market.

(c) IBM's attempts to monopolize and monopolization of the manufacture and distribution of electronic data processing equipment by restricting its rental customers more favorably than purchase customers, thereby discriminating against purchasers of IBM equipment.

18. IBM supplies its full complement of software without additional charge only to lessees of IBM equipment. IBM has been moved physically from one location to another or has had its work load of stored programs and data changed. Thus, for example, by virtue of this wholly arbitrary definition, used IBM equipment returned to a leasing company such as plaintiff at the expiration of a lease is IBM's equipment. IBM is to be subsequent user equipment regardless of its age or number of prior users, while

used IBM equipment leased directly from IBM is never deemed subsequent user equipment. Over the past years, IBM has maintained this policy, rarely clearly articulated, with regard to the nature and extent of the various items of software withheld from users of subsequent user equipment. At present, upon information and belief, users of subsequent user equipment cannot under any circumstances receive from IBM the services of its systems engineers or on-site training and education in the use of IBM electronic data processing equipment and can receive basic operations programs and applications programs from IBM only upon payment to IBM of an additional charge. Thus, when equipment becomes subsequent user equipment, that portion of the initial purchase price of the equipment which includes charges for all software—basic operations programs, applications programs, systems engineering services and educational services—is in large part forfeited. In contrast, all IBM lessees and users of first user equipment continue to receive all software from IBM indefinitely at no additional charge.

19. The practices set forth in paragraph 18 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) The value, either for resale or re-lease, of all IBM electronic data processing equipment owned by plaintiff or other leasing companies has been and is arbitrarily and drastically reduced to a level substantially below the value of like equipment owned by IBM, regardless of its age or number of prior users of such equipment.

(ii) Users of purchased IBM electronic data processing equipment, unlike IBM lessees, are restrained from physically moving such equipment from one location to another or changing its work load of stored programs and data under penalty of having it become "subsequent user" equipment with the resultant loss of software.

(iii) Owners of IBM electronic data processing equipment, including plaintiff, have been and are foreclosed from selling or leasing their equipment to large numbers of potential users thereof, including the United States government, which ordinarily refuse to purchase or lease subsequent user equipment solely because of IBM's discriminatory policies with respect thereto.

(iv) Owners of IBM electronic data processing equipment, including plaintiff, have been foreclosed from selling or leasing their equipment except at reduced, unreasonably low, or price levels solely because of IBM's discriminatory policies with respect to subsequent user equipment.

(v) Owners of IBM electronic data processing equipment, including plaintiff, have been and are effectively foreclosed from the short-term leasing market solely because of IBM's discriminatory policies with respect to subsequent user equipment.

(vi) The reduction in resale or re-lease value of subsequent user equipment attributable solely to IBM's subsequent user policy has forced companies such as plaintiff, engaged in the leasing of IBM equipment, to pay unreasonably high finance charges in connection with their purchase of such equipment and has limited the number of credit advances which such companies on account of such purchases.

(vii) Users and potential users of IBM electronic data processing equipment have been coerced and compelled by IBM's discriminatory policies with respect to subsequent user equipment to purchase or lease equipment directly

from IBM, thus unreasonably restraining free and open competition from leasing companies in the used electronic data processing equipment market, unreasonably depriving such users and potential users of electronic data processing equipment of the benefits of such free and open competition and further concentrating ownership and distribution of IBM equipment in the hands of IBM.

20. IBM personnel have continuously and repeatedly intimidated prospective customers from obtaining purchased electronic data processing equipment either directly from IBM or indirectly through leasing companies such as plaintiff and have coerced such prospective customers solely to lease electronic data processing equipment from IBM. Such intimidation and coercion has taken the form, for example, of threatened withdrawal of software from companies expressing an interest in obtaining any IBM electronic data processing equipment on terms other than a lease from IBM. IBM makes such intimidation and coercion possible by deliberately and willfully failing and refusing to define the nature and extent of the nature and extent of the software of IBM electronic data processing equipment are entitled. More particularly, IBM has willfully failed and refused to define the nature and extent of the software to which users of mixed systems (i.e., systems including both first user and subsequent user IBM electronic data processing equipment) are entitled. IBM has intentionally encouraged and continues to encourage such intimidation and coercion by IBM personnel in the leasing of IBM equipment rather than leasing IBM electronic data processing equipment; in fact, if all IBM equipment were sold rather than leased, under the present leasing policy, the plan on most IBM equipment IBM's sales force would receive a net commission of exactly \$0.00.

21. The practices set forth in paragraph 20 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Users and prospective users of IBM electronic data processing equipment are discouraged from obtaining purchased electronic data processing equipment either directly from IBM or indirectly through leasing companies such as plaintiff and are instead coerced to lease electronic data processing equipment solely from IBM.

(ii) Leasing companies such as plaintiff are prevented from competing on a fair basis with IBM and have been and are deprived of substantial revenues from prospective lessees who have been induced by intimidation and coercion solely to lease from IBM.

(iii) The value, either for resale or re-lease, of all IBM electronic data processing equipment owned by plaintiff or other leasing companies has been and is unreasonably reduced to a level substantially below the value of like equipment owned by IBM, regardless of the age or number of prior users of such equipment.

22. IBM has failed and refused to establish selling prices for its electronic data processing equipment which bear a commercially reasonable relationship to its manufacturing and distribution costs and to designed its price structure for the distribution of electronic data processing equipment with the intent of making such equipment unreasonably commercially disadvantageous, impractical and unrealistic in light of IBM's terms for leasing the identical equipment. Upon information and belief, more than 90% of the presently installed IBM electronic data processing equipment is on direct lease from

(Continued on Page 4A)

Text of DPF&G Antitrust Suit Against IBM

(Continued from Page 3A)

IBM. Moreover, upon information and belief, less than 5% of currently installed IBM electronic data processing equipment was purchased from IBM by a user of such equipment. IBM has achieved this drastic limitation of sales of its electronic data processing equipment by establishing economically unjustified disparities of as great as 50 to 1 between its sales and monthly rental prices of central processing units and of up to 60 to 1 with respect to peripheral equipment and by generally refusing to sell used electronic data processing equipment at any reduction in price. IBM recently has intensified its efforts in this regard by setting the sales prices of its latest models of electronic data processing equipment (IBM series 360/25 and 360/85) at between \$2 and \$7 times the IBM monthly rental for such equipment in a further attempt to concentrate ownership of virtually all IBM electronic data processing equipment in its own hands.

23. The practices set forth in paragraph 22 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Because plaintiff and other leasing companies have been forced either to pay unreasonably high prices for the purchase of IBM electronic data processing equipment or to obtain unreasonably low rentals for such equipment in order to compete with IBM, free and open competition in the market for used IBM electronic data processing equipment has been unreasonably restrained.

(ii) Prospective users of IBM electronic data processing equipment have been induced by IBM's unreasonable pricing policies to lease equipment from IBM rather than to purchase such equipment either directly or indirectly through a leasing company such as plaintiff.

(iii) Sales of IBM electronic data processing equipment as a percentage of total installations of such equipment have been and continue to be at an artificially low level, thus unreasonably restraining competition in the market for used IBM electronic data processing equipment by concentrating ownership of at least 90% of such equipment in IBM.

(iv) Plaintiff and other leasing companies will be wholly unable to compete with IBM in the leasing of IBM's newest equipment (series 360/25 and 360/85) and the possibility of competition in the leasing of such equipment will be effectively eliminated.

24. IBM allows a substantial discount to educational institutions which lease or purchase electronic data processing equipment directly from IBM. IBM has failed and refused and continues to fail and refuse to allow any discount to leasing companies such as plaintiff in connection with the purchase of such equipment intended expressly for use by educational institutions. The value of IBM electronic data processing equipment currently being used by educational institutions is approximately \$800 million.

25. The practices set forth in paragraph 24 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Plaintiff and other leasing companies have been completely foreclosed from competing with IBM in the substantial submarket of leasing IBM electronic data processing equipment to educational institutions.

(ii) Educational institutions have been deprived of the benefits of free and open competition between IBM and leasing companies such as plaintiff in

the leasing of IBM electronic data processing equipment.

26. IBM has discriminated and continues to discriminate between users of purchased IBM electronic data processing equipment and users of IBM equipment leased directly from IBM in the furnishing of maintenance, improved hardware and hardware features. Numerous maintenance items which are available at no extra charge to IBM leases are made available to users of purchased IBM electronic data processing equipment only at additional and unreasonable charges in addition to the charges paid by such users for IBM maintenance contracts. Thus, for example, IBM has made exorbitant charges to plaintiff's lessees for installation of IBM electronic data processing equipment and the furnishing of improved hardware and hardware features which make no similar charge to IBM leases. Similarly, IBM repairs rather than replaces defective parts on purchased IBM electronic data processing equipment, whereas defective parts on equipment leased directly from IBM are replaced with new parts. Maintenance services, improved hardware and hardware features are promptly given to IBM leases, whereas they are furnished to users of IBM purchased equipment often only after considerable delay. IBM affords no credit to users of purchased IBM electronic data processing equipment during periods of malfunction or testing, whereas full credit is afforded to IBM leases. IBM has no similar credit to maintenance contract on certain items of peripheral equipment if such items are purchased rather than leased directly from IBM.

27. The practices set forth in paragraph 26 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Potential users of IBM electronic data processing equipment have been discouraged from obtaining such equipment except on a direct lease from IBM and plaintiff and other leasing companies have been deprived of substantial revenues from such potential users.

(ii) Purchasers of IBM electronic data processing equipment and users of such purchased equipment, including plaintiff and its lessees, have for considerable periods of time been deprived of the use of their equipment, and the use of improved hardware and hardware features, and have been forced to pay unreasonably and exorbitant charges for improved hardware, hardware features and maintenance of such equipment.

(iii) The effective ratio between the purchase price of IBM electronic data processing equipment and the IBM rental price for such equipment has been further increased, thus further foreclosing competition between IBM and leasing companies such as plaintiff in the leasing of IBM electronic data processing equipment and depriving users and potential users of such equipment of the benefits of such competition.

(iv) IBM's utilization of its monopoly of maintenance of electronic data processing equipment attempts to monopolize the manufacture and distribution of electronic data processing equipment.

28. Under certain circumstances, IBM will provide maintenance for non-IBM manufactured electronic data processing equipment which is mechanically, electrically or electronically interconnected with IBM electronic data processing equipment. IBM has announced and

maintains a stringent policy of refusing to provide maintenance for non-IBM equipment which IBM deems "competitive equipment", i.e., non-IBM equipment which provides a function performed by IBM equipment. IBM's personnel intimate data prospective customers having IBM electronic data processing installations from acquiring or testing any competitive peripheral equipment by threatening that maintenance of the entire installation will be jeopardized. In practice, such threatened effect has occurred repeatedly, as, for example, when IBM maintenance personnel invariably determine initially that any malfunction on such a multiple supplier installation is attributable to the non-IBM equipment. Moreover, IBM provides maintenance only at unreasonably high and discriminatory rates to installations using IBM electronic data processing equipment in conjunction with "non-competitive" non-IBM peripheral equipment.

29. The practices set forth in paragraph 28 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Solely because of IBM's discriminatory maintenance policy with respect to peripheral equipment which is competitive with IBM equipment, users of IBM electronic data processing equipment have been and are discouraged from purchasing or leasing any such competitive equipment. This policy has had such continuing effect as its intended effect even where competitive equipment, such as Ampex tape drives, sells for substantially less than and is of at least equal quality to similar equipment manufactured by IBM.

(ii) Manufacturers and distributors and potential manufacturers and distributors of electronic data processing equipment competitive with that manufactured by IBM, including plaintiff, have been and are foreclosed from the sale or leasing of such equipment to large numbers of potential users thereof with a resultant loss of substantial revenues.

(iii) Purchasers and users of multiple supplier installations have been compelled to pay unreasonably high and discriminatory prices for IBM maintenance.

(iv) IBM's utilization of its monopoly of software to attempt to monopolize and to monopolize the manufacture and distribution of electronic data processing equipment.

30. Principally as a result of the unlawful practices set forth in paragraph 14, IBM has had a substantial increase in its monopolistic prices charged by IBM since 1956 for the package of electronic data processing equipment and software and various other unlawful practices such as the use of customer groups to aid IBM in improving its software, IBM has been able to develop a far more varied and extensive library of basic operations programs, applications programs and educational materials and far greater technical expertise with respect to systems engineering services and educational services than any other manufacturer of electronic data processing equipment. Because IBM software has almost no practical value (even if available) with non-IBM electronic data processing equipment, IBM has been able to use and has used its unlawfully acquired monopoly in software to persuade and coerce prospective customers to purchase or lease IBM equipment rather than equipment of other manufacturers.

31. The practices set forth in paragraph 30 were intended to have, have had and continue to have, *inter alia*, the following anticompetitive effects:

(i) Manufacturers and potential manu-

facturers of electronic data processing equipment, including plaintiff, have been foreclosed from a substantial share of the electronic data processing equipment market.

(ii) Lessees and purchasers of electronic data processing equipment, such as plaintiff, have been denied the benefits of free and open competition in the electronic data processing equipment market.

(iii) IBM's attempts to monopolize and monopolize the distribution of electronic data processing equipment by establishing and maintaining policies and engaging in acts and practices deliberately designed to eliminate electronic data processing equipment leasing companies as competitors, to confine such companies to a drastically limited share of the market for the distribution of such equipment, and otherwise to prevent free and open competition with IBM by such leasing companies in the distribution of such equipment.

32. A major purpose underlying IBM's anticompetitive acts and practices set forth in paragraphs 18, 20, 22, 24, 26 and 28 heretofore has been, is, and continues to be, the elimination of independent leasing companies and IBM in the distribution of electronic data processing equipment. Moreover, IBM has sought to intensify these acts and practices in direct response to the growth and development in recent years of electronic data processing equipment leasing companies. IBM's information and intelligence gathering activities have been coordinated and directed, in part, by a high-level policymaking committee known as the "Leasing Company Relations Department" which, like various predecessor departments, committees and individuals, IBM, had at its disposal to function the formulation of policies and practices calculated to eliminate or hinder competition from leasing companies. IBM's anticompetitive acts and practices described in paragraph 18, at one time unpublicized and rarely enforced, more recently have been announced with increasing frequency, although some of the same acts and policies, the policy has been elaborated upon, refined, defined, redefined and then utilized repeatedly by IBM personnel to prevent competition by independent leasing companies. Similarly, instances of intimidation and coercion as described in paragraphs 20 and 28 heretofore, designed to force prospective user of electronic data processing equipment to lease directly from IBM, have become more frequent and more specifically pointed at customers and potential customers of independent leasing companies. IBM's pricing policies for the sale and rental of IBM equipment as set forth in paragraphs 22 and 24 heretofore, designed to force, against purchasers of IBM equipment, have been structured in recent years with the specific intent of preventing or curbing the growth and expansion of independent leasing companies. Furthermore, the existence of the long-standing discriminatory policies between sale and rental customers described in paragraphs 20, 26 and 28 has increasingly been used flagrantly and persistently by IBM personnel to prevent leasing companies from obtaining customers, IBM's market penetration plan, always discriminatory against IBM sales personnel who sell rather than lease, has become increasingly discriminatory against leasing companies. In particular, severely punitive treatment of IBM's sales force who allows subsequent user purchased equipment - most of which is owned by leasing companies - to use other IBM equipment in its territory. In addition, IBM has established increasingly arbitrary and discriminatory policies intended to prevent independent leasing companies from competing with IBM.

(Continued on Page 5A)

Text of DPF&G Antitrust Suit Against IBM

(Continued from Page 4A)

companies from purchasing electronic data processing equipment on credit. In light of IBM's demonstrated aim of eliminating or impairing competition by leasing companies, it is clear that IBM's leasing policy directive to its branch managers earlier this year that leasing companies were to be treated as "competitors in every sense of the word" was intended to maximize the effectiveness of the arbitrary and discriminatory practices directed at leasing companies hereinbefore described.

33. The practices set forth in paragraph 32 were intended to have, and have continued to have, *inter alia*, the anti-competitive effects described in paragraphs 19, 21, 23, 25, 27 and 29 and, more particularly, have confined leasing companies such as plaintiff to a drastically limited share of the market for the distribution of electronic data processing equipment and have otherwise prevented free and open competition with IBM by leasing companies in the distribution of such equipment.

COUNT II

34. Continuously to the date of the filing of this complaint IBM has engaged in the tie-in practices set forth in paragraphs 14, 16 and 30 hereof and has entered into numerous contracts, agreements and understandings in implementation thereof.

35. The aforesaid tie-in practices and contracts, agreements and understandings entered into in implementation thereof have restrained substantial volumes of interstate and foreign commerce in the respective markets for electronic data processing equipment, software and maintenance, all as more fully set forth in paragraphs 15, 17 and 31 hereof, in violation of Section 1 of the Sherman Antitrust Act and Section 3 of the Clayton Antitrust Act.

COUNT III

36. Continuously to the date of the filing of this complaint IBM has engaged in the practices set forth in paragraphs 18, 20, 22, 24, 26, 28 and 32 hereof and has entered into numerous contracts, agreements and understandings in implementation thereof.

37. The aforesaid practices and the contracts, agreements and understandings entered into in implementation thereof have restrained substantial volumes of interstate and foreign commerce in the respective markets for electronic data processing equipment, software and maintenance, all as more fully set forth in paragraphs 19, 21, 23, 25, 27, 29 and 33 hereof, in violation of Section 1 of the Sherman Antitrust Act.

COUNT IV

38. Continuously to the date of the filing of this complaint IBM has engaged in the discriminatory practices set forth in paragraphs 18, 20, 22, 24, 26, 28 and 32 hereof.

39. The effects of the aforesaid practices have been substantially to lessen competition, to tend to create a monopoly and to injure, destroy and prevent competition in the respective markets for electronic data processing equipment, software and maintenance, all as more fully set forth in paragraphs 19, 21, 23, 25, 27, 29 and 33 hereof, in violation of Section 2 of the Clayton Antitrust Act as amended by the Robinson-Patman Act.

COUNT V

40. On or about January 25, 1956, in an action entitled *United States of America v. International Business Machines Corporation* (S.D.N.Y., Civil Action No. 72-344), IBM consented to the entry of a judgment (hereinafter referred to as the "Consent Decree") which embodied var-

ious agreements and obligations on the part of IBM in connection with IBM's former activities in the electronic data processing equipment industry. A copy of the Consent Decree is annexed hereto and made a part hereof.

41. Plaintiff is a member of the class intended to be benefited by the provisions of the Consent Decree.

42. Continuously from or about 1956 IBM has breached its agreement and obligations under the Consent Decree as follows:

(a) By the acts and practices set forth in paragraphs 14, 16, 18, 20, 22, 24, 26 and 30 hereof, IBM has breached its agreement and obligation under paragraph IV(c)(2) of the Consent Decree to establish sales prices for electronic data processing equipment bearing a commercially reasonable relationship to rental charges for such equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraphs 15, 17, 19, 21, 23, 25, 27 and 31 hereof.

(b) By the acts and practices set forth in paragraphs 16, 18, 20, 22, 24, 26 and 32 hereof, IBM has breached its agreement and obligation under paragraph IV(c)(3) of the Consent Decree to establish generally nondiscriminatory terms, in connection with reasonable credit terms, in connection with the sale of electronic data processing equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraphs 17, 19, 21, 23, 25, 27 and 33 hereof.

(c) By the acts and practices set forth in paragraph 20 hereof, IBM has breached its agreement and obligation under paragraph IV(c)(4) of the Consent Decree to allow a reasonable compensation for selling electronic data processing equipment which is not less favorable to them than their compensation for leasing such equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraph 21 hereof.

(d) By the acts and practices set forth in paragraphs 14, 16, 18, 20, 22, 24, 26 and 30 hereof, IBM has breached its agreement and obligation under paragraph IV(c)(5) of the Consent Decree to make full and fair disclosure of the prices and terms for the sale and lease of electronic data processing equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraphs 15, 17, 19, 21, 23, 25 and 31 hereof.

(e) By the acts and practices set forth in paragraph 18 hereof, IBM has breached its agreement and obligation under paragraph VI(a) of the Consent Decree to offer without separate charge to purchasers of electronic data processing equipment the same services, other than maintenance, which it renders without separate charge to lessees of such equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraph 19 hereof.

(f) By the acts and practices set forth in paragraphs 16, 26 and 28 hereof, IBM has breached its agreement and obligation under paragraph VI(b) of the Consent Decree to offer maintenance at nondiscriminatory prices and terms to lessees of IBM electronic data processing equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraphs 17, 27 and 29 hereof.

(g) By the acts and practices set forth in paragraphs 16 and 26 hereof, IBM has breached its agreement and obligation under paragraph VI(c) of the Consent Decree to offer to sell at reasonable and nondiscriminatory prices and terms to owners of IBM electronic data process-

ing equipment repair and replacement parts and subassemblies for such equipment. By reason of the foregoing, plaintiff has been damaged in the manner set forth in paragraphs 17 and 27 hereof.

COUNT VI

43. The acts and practices set forth in paragraphs 14, 16, 18, 20, 22, 24, 26, 28, 30 and 32 hereof and were reasonably foreseeable to and by IBM and have been carried out with the intent of injuring plaintiff in the manner set forth in paragraphs 15, 17, 19, 21, 23, 25, 27, 29, 31 and 33 hereof and have constituted and constitute unfair competition and unlawful interference with plaintiff's advantageous business and commercial relationships.

PRAYER FOR RELIEF

WHEREFORE, the plaintiff prays:

1. That the Court adjudge and decree that the aforesaid monopolization, attempt to monopolize, and contracts, combinations and conspiracies to monopolize and restrain interstate and foreign commerce and trade in electronic data processing equipment, software and maintenance are in violation of Sections 1 and 2 of the Sherman Antitrust Act and Section 3 of the Clayton Antitrust Act;

2. That IBM and each of its officers, directors, agents, employees, successors and assigns, and all other persons acting under, through or for IBM be perpetually enjoined and restrained from, in any manner, directly or indirectly, continuing, maintaining or renewing the foregoing violations;

3. That the Court order and direct that IBM wholly divest its manufacture and sale of electronic data processing equipment from the leasing of such equipment, the production and supplying of software and the furnishing of maintenance by transferring its leasing, software and maintenance operations respectively to three corporate subsidiaries called the "Leasing Corporation", the "Software Corporation" and the "Maintenance Corporation"; and that the Court enjoin and restrain IBM from soliciting any order for the leasing of electronic data processing equipment, the production or supplying of software and the furnishing of maintenance for electronic data processing equipment;

4. That the Court enjoin and restrain the Leasing Corporation, the Software Corporation and the Maintenance Corporation individually from:

(a) using any corporate name containing the words "International Business Machines" or "IBM";

(b) employing any person also employed by IBM, any subsidiary of IBM or either of the other two corporations described herein;

(c) soliciting any order for the sale of any goods or the furnishing of any services by IBM, any subsidiary of IBM or either of the other two corporations described herein;

(d) leasing office or other space from or otherwise occupying the same business premises as IBM, any subsidiary of IBM or either of the other two corporations described herein;

5. That the Court order and direct IBM, the Leasing Corporation, the Software Corporation and the Maintenance Corporation individually establish separate commercially reasonable prices for each item of electronic data processing equipment, software or maintenance offered by each such corporation respectively;

6. That the Court enjoin and restrain IBM, the Leasing Corporation, the Software Corporation and the Maintenance Corporation individually from offering

two or more items of electronic data processing equipment, software or maintenance at a lower price than the sum of the separate prices of the several items involved;

7. That the Court order and direct that IBM, the Leasing Corporation, the Software Corporation and the Maintenance Corporation each maintain, in accordance with the separate accounting practices, separate and complete corporate records and accounts which shall be audited annually by independent public accountants and which shall be open to inspection by plaintiff on reasonable notice during normal business hours for the purpose of securing compliance with the orders of this Court made in this action;

8. That the Court order such other and further relief by way of divorcement, divestiture and re-organization with respect to the business and properties of IBM, the Leasing Corporation, the Software Corporation and the Maintenance Corporation, as the Court may consider necessary or appropriate to dissipate the effects of the unlawful acts and practices hereinbefore alleged and to establish and maintain competitive conditions in the electronic data processing industry;

9. That the Court award judgment in favor of plaintiff in the amount of \$1,054,500,000, representing treble the amount of its damages to the date of the filing of this complaint sustained as a result of IBM's aforesaid acts and practices in violation of Section 1 and 2 of the Sherman Antitrust Act, Section 3 of the Clayton Antitrust Act and Section 2 of the Robinson-Patman Act as amended by the amount of any damages sustained by plaintiff as a result of such acts or practices subsequent to the filing of this complaint, plus interest;

10. That the Court award judgment in favor of plaintiff the amount of \$351,500,000, representing plaintiff's damages to the date of the filing of this complaint sustained as a result of IBM's aforesaid acts and practices in violation of its agreements and obligations under the Consent Decree, plus the amount of any damages sustained by plaintiff as a result of such acts or practices subsequent to the filing of this complaint, plus interest;

11. That the Court adjudge and decree that the aforesaid acts and practices constitute unfair competition and interference with plaintiff's advantageous business and contractual relationships, and award judgment in favor of plaintiff in the amount of \$351,500,000, representing plaintiff's damages to the date of the filing of this complaint sustained as a result of IBM's aforesaid acts and practices of unfair competition and interference with plaintiff's advantageous business and contractual relationships, plus the amount of any damages sustained by plaintiff as a result of such acts or practices subsequent to the filing of this complaint, plus the amount of any exemplary and punitive damages on account of such practices, plus interest;

12. That the Court award plaintiff the costs of this action, including reasonable attorneys' fees.

13. That the Court order such other, further and different relief as to the Court may seem just and proper; and

14. That the Court retain jurisdiction for the purpose of enabling plaintiff to apply to the Court at any time for such further orders and directions as may be necessary or appropriate for the construction or carrying out of any orders made in this action, for the modification of any such orders, and the enforcement of compliance therewith and the punishment of any violations thereof.

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